Concept 2 Revision

Self-Assessment 9 till Lesson 4

1 (A) Choose from column (B) what suits it in column (A).

(A)	(B)
1. Digestion process 2. Urination process 3. Excretion process	a. is the process in which excretory system collects the waste materials produced by cells and removes them from the body. b. is the process of converting the complex food into simpler substances that the body can use for energy and growth. c. is the process of taking oxygen gas and expelling carbon dioxide gas. d. is the process of expelling urine outside the body.

1. .... 2. .... 3. ....

(B) Give a reason for the following :

Importance of respiratory system in excretion process.

....

2 (A) Correct the underlined words :

1. Urea is formed due to the breaking down of carbohydrates inside the body cells. (....................)
2. Pancreas and gallbladder secrete their enzymes inside stomach to complete the digestion of food. (....................)
3. Skeletal muscles are considered as involuntary muscles. (....................)

(B) What happens if ... ?

Glycogen that is stored in liver and muscles when you are exposed to a danger situation.

....

3 The following table shows three different systems and organs that share in the excretion process and their excretory products, Mention the name of each of them :

System / Organ	The excretory product
System (A)	Carbon dioxide
System (B)	Urine
Organ (C)	Sweat

1. System (A) represents ....
2. System (B) represents ....
3. Organ (C) represents ....

Self-Assessment 10 till Lesson 5

1 (A) Choose the correct answer :

1. All the following muscles are considered as voluntary muscles, except muscles of ....
   a. forearm. b. heart. c. neck. d. upper arm.
2. What is the system that transports the waste materials from the body cells to the urinary system ? ....
   a. Respiratory system. b. Digestive system.
   c. Nervous system. d. Circulatory system.

3. Endocrine system secretes .... that control the body temperature and the blood pressure.

   a. hormones   b. water   c. blood   d. urea

(B) Give a reason for the following :

People whose kidneys are not working well may get harmed.

....

2 (A) Write the scientific term of each of the following :

1. An organ which is formed from cardiac muscle. (......................)
2. A system which helps in secreting saliva inside the mouth during chewing of food. (......................)
3. It is the organ which transports the urine from the two kidneys to the bladder. (......................)

(B) What is the waste material that is produced from breaking down of proteins inside the body cells ?

....

3 Classify the following words in the table below :

(Urea – Blood cells – Water – Proteins)

Substances pass through nephrons	Substances cannot pass through nephrons
....	....
....	....
....	....

Self-Assessment 11 till Lesson 6

1 (A) Complete the following sentences using the words below :

(digestive – insulin – musculoskeletal)

1. Researchers work to develop the artificial pancreas to pump .... directly inside the body of diabetics.
2. Pancreas is the organ that belongs to endocrine system and helps the .... system in digestion process.
3. Bones, muscles, tendons, ligaments and cartilages belong to .... system.

(B) Give a reason for the following :

Some diabetics use insulin pump device.

....

2 (A) Cross out the odd word :

1. Esophagus – Heart – Stomach – Large intestine. (....................)
2. Lungs – Trachea – Diaphragm – Brain. (....................)
3. Gallbladder – Kidneys – Ureter – Urethra. (....................)

(B) What happens if ... ?

Pancreas cannot secrete insulin hormone in the blood of a person.

....

3 Look at the opposite figure, then complete the following diagram that explains the steps of urination process :

1. Blood is filtered in organ number ....

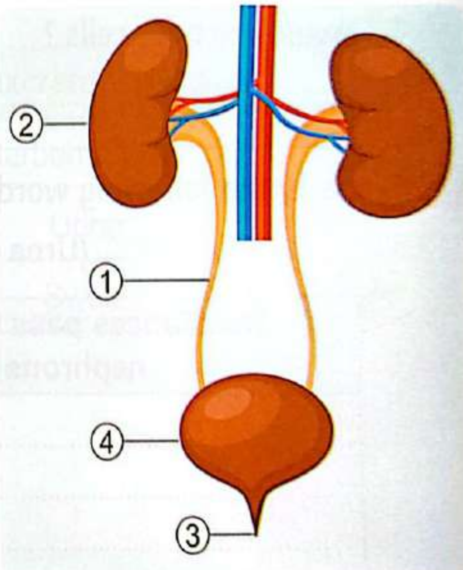
↓

2. Then urine is transported to organ number .... by the help of organ number ....

↓

3. The urine is stored in organ number .... until it is expelled outside the body by the help of organ number ....

↓



Model Exam on Concept (1.2)

Total mar[ks]

15

1 (A) Choose the correct answer : (5 mar[ks])

1. In dangerous situations, ...
   a. all systems of the body interact together.
   b. circulatory system interacts with digestive system only.
   c. nervous system sends a message to digest food in stomach.
   d. respiratory system interacts with circulatory system only.
2. All the following are happened by the help of endocrine system to face or to run away from danger, except ....
   a. contraction of your muscles. b. increasing your breathing rate.
   c. increasing your heartbeats. d. digestion of food that you eat.
3. All the following are responsible for excretion process, except ....
   a. digestive system. b. skin.
   c. respiratory system. d. urinary system.
4. Your leg moves due to contraction and relaxation of .... connected to the bones of leg.
   a. hairs b. toes c. skin d. muscles

(B) Give a reason for the following :

Undigested food becomes solid wastes inside the large intestine.

....

2 (A) Put (✓) or (X) : (5 mar[ks])

1. People whose kidneys are not working properly must use other devices to filter their blood from waste. (
2. The insulin pump device helps diabetics control the water level in the blood with automatic injections of insulin. (
3. The acid and enzymes which are secreted inside stomach lead to more breaking down of food. (
4. The muscles that help you move your eyes in ... directions are considered as voluntary muscles. (

(B) What happens to ...?

The lungs when the diaphragm muscle contracts.

....

3 **(A) Complete the following sentences using the words below :** *(5 marks)*

(oxygenated – energy – sweat – muscles)

1. When you touch a sharp thorn, your hand moves away quickly due to the interaction between nervous system and .... in your hand.
2. Skeletal muscles can store and use .... quickly.
3. When your heartbeats and breathing rate increase, your body sends more .... blood to the muscles and brain to face the danger.
4. Some waste products leave your body in the form of .... through your skin.

(B) Look at the following figures, then complete the following sentences :



Figure (A)



Figure (B)

1. The forearm in figure .... moves up toward your shoulder.
2. The forearm in figure .... moves down away from your shoulder.
3. The muscles in front of the upper arm contract in figure .... and relax in figure ....
4. The muscles in the back of the upper arm contract in figure .... and relax in figure ....

Self-Assessments
on Concept (1.3)

Self-Assessment 12 On Lesson 1

1 (A) Put (✓) or (X) :

1. The best way to see the magnetic field is to allow a magnet attract some pieces of glass. ( )
2. All objects are holded on Earth's surface due to its gravity. ( )
3. Like gravity, we can see the magnetic field. ( )

(B) What happens if ... ?

The distance between objects and the center of Earth increases.

....

2 (A) Choose from column (B) what suits it in column (A) :

(A)	(B)
1. Magnetism	a. is one of the factors that affect the force of gravity.
2. Mass	b. affects all objects on Earth's surface.
3. Magnetic field	c. is the force of the magnet on other magnets.
4. Gravity	d. is the area in which the effect of the magnet appears.

1. .... 2. .... 3. .... 4. ....

(B) Give a reason for the following :

Gravity and magnetism are different from other forces.

....

3 Correct the underlined words :

1. Mass and distance are the two factors that affect <u>magnetic field</u>. ( )
2. Gravity is always downward <u>pushing</u> force. ( )

Self-Assessment 13 till Lesson 2

1 **(A) Complete the following sentences :**

1. The force of gravity .... by increases the mass of an object.
2. Some materials don't attract to the magnet like .... and ....
3. Earth attracts all objects toward its .... due to its .... force.

(B) Give a reason for the following :

On a pproaching a magnet to some pieces of plastic, they will not attract to the magnet.

....

2 **(A) Put (✓) or (X) :**

1. Gravity of Earth can attract all objects to its surface while magnets cannot. ( )
2. Magnetism and electricity can work together. ( )
3. Gravity and magnetism are similar in that they must be in contact with other objects. ( )

(B) Correct the underlined words :

1. Iron and cobalt are considered non-magnetic materials. (......................)
2. The magnetic field of a magnet can be observed by using aluminum foil. (......................)

3 **Using the words below to complete the following sentences :**

(magnetic field – cobalt – pulling force – plastic)

1. Nickel and .... are magnetic materials, while copper and .... are non-magnetic materials.
2. The magnet is always surrounded by an area called ....
3. Gravity of Earth is always ....

Self-Assessment 14 till Lesson 3

1 **(A) Choose the correct answer :**

1. The generator consists of .... and ....
   a. large magnets – plastic tube. b. copper coil – wind turbine
   c. large magnets – coiled wires. d. small magnets – battery.
2. The area around the conducting wire that forms a magnetic effect is called ....
   a. the electric curcuit. b. the magnetic field.
   c. the electric current. d. the gravity force.
3. Electricity can be generated from ....
   a. wind and sand. b. water and glass.
   c. wind and water. d. copper and plastic.

(B) What is the importance of .... ?

1. The electric switch ....
2. The battery ....

2 **(A) Correct the underlined words :**

1. Electricity is the force by which Earth attracts all objects to its surface. (....................)
2. Plastic and iron are electric insulators. (....................)
3. Sound energy is changed into electrical energy in the generator. (....................)

(B) Give a reason for the following :

Copper is not considered as a magnetic material.

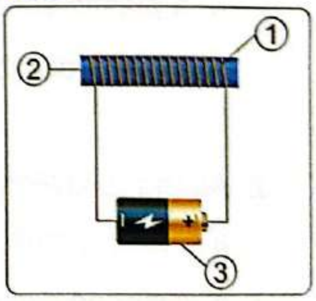
....

....

3 **Look at the opposite figure the answer the following questions :**

(a) Label the figure.

1. ....
2. ....
3. ....



(b) This figure indicates that .... and .... can work together (choose).

1. sound and electricity 2. light and magnetism
3. magnetism and electricity 4. light and electricity

Self-Assessment 15 till Lesson 4

1 (A) Put (✓) or (X) :

1. Iron and plastic are used in making magnets. ( )
2. Electric current can be converted into sound energy by generators. ( )
3. Cobalt, steel and nickel are magnetic materials. ( )

(B) Give a reason for the following :

The battery is very important in the electric circuit.

....

2 (A) Write the scientific term of each of the following :

1. The movement of electrons in an electric wire. (....................)
2. The materials which are used in making the electric wires. (....................)
3. The materials that are used to cover the electric wires. (....................)

(B) Cross out the odd word :

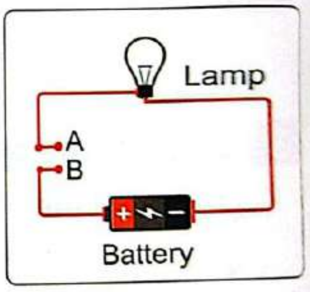
1. Copper – Iron – Plastic – Aluminum. (....................)

....

2. Nickel – Cobalt – Steel – Copper. (....................)

....

3 Look at the opposite electric circuit then answer :



1. The lamp will light when .... is used to connect points (A) and (B) .

a. a plastic spoon b. a piece of wood

c. a piece of rubber d. an iron nail

2. All the following can connect points (A) and (B) to form a closed circuit, <u>except</u> ....

a. a closed switch. b. a lamp.

c. a battery. d. an opened switch.

Self-Assessment 16 till Lesson 5

1 **(A) Write the scientific term of each of the following :**

1. The energy that is produced from electric generators. (....................)
2. Materials that allow electric current to flow through them easily. (....................)
3. They are components of an electric circuit that limit the flow of electric current. (....................)

(B) Correct the underlined words :

1. The internal switch on a battery is an automatic switch to adjust the temperature of a refrigerator. (....................)
2. In the parallel circuits, the electric current flows in only one path. (....................)

2 **(A) Choose from column (B) what suits it in column (A) :**

(A)	(B)
1. Nickel 2. Galvanometer 3. Plastic	a. is an insulator used to coat the electric wires. b. is a magnetic material that is attracted to the magnet. c. is a non magnetic material but it is an electric conductor. d. is used to detect the flow of small electric currents.

1. .... 2. .... 3. ....

(B) What happens to ... ?

The amount of generated electric current on moving a magnet rapidly inside a coil of copper wire.

....

3 **Look at the following figures then answer :**

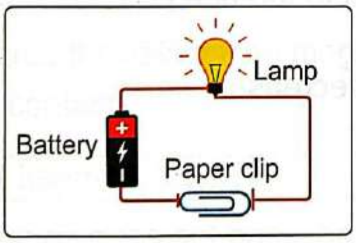


Figure (A)

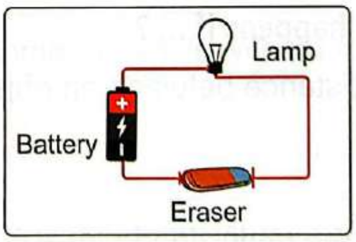


Figure (B)

(A) Choose the correct answer :

1. The light bulb will light in .... (figure (A) – figure (B))
2. Eraser is considered .... (an electric conductor – an electric insulator)

(B) Put (✓) or (X) :

1. If the paper clip in figure (A) is replaced by a piece of rubber, the light bulb will light. ( )
2. If we put a galvanometer in figure (B) instead of the battery, the light bulb will light. ( )

Self-Assessment 17 till Lesson 6

1 (A) Choose the correct answer :

1. .... is an important tool that is used to make the heart of patients move regularly.
   a. Magnet b. Pacemaker c. Plastic spoon d. Lamp
2. A .... is formed, when an electric current flows through a wire.
   a. gravity force b. repulsion force
   c. magnetic field d. vibration
3. All the following are magnetic materials, except ....
   a. aluminum. b. cobalt. c. iron. d. nickel.

(B) Give a reason for the following :

The electric circuit contains a switch.

....

2 (A) Put (✓) or (X) :

1. Water turbines help the generators to spin and generate electricity. ( )
2. The electric current flows easily through plastic. ( )
3. Thermostat is used to adjust the temperature of a refrigerator. ( )

(B) What happens if ... ?

The distance between an object and Earth decreases.

....

3 Correct the underlined words :

1. The gravity is the movement of electric charges through a wire. (......................)
2. The tool that is used to slow the flow of an electric current through the electric circuit is known as a battery. (......................)

Model Exam on Concept (1.3)

Total mark
15

1 (A) Put (✓) or (X) : *(5 marks)*

1. Magnetism is an attraction or repulsion force, while gravity is a repulsion force only. (   )
2. The electric devices in houses are connected in series circuits. (   )
3. The artificial pacemaker should contain a battery to do its function. (   )
4. All magnets can be made of some materials, like iron and glass. (   )

(B) Give a reason for the following :

All metals are considered as electric conductors.

....

....

---

2 (A) Write the scientific term of each of the following : *(5 marks)*

1. It is used to adjust the temperature inside some devices such as the refrigerator. (........................)
2. A muscle in the human body that beats regularly to push the blood inside the body. (........................)
3. The movement of charged particles through a conducting wire. (........................)
4. The area around the magnet at which the magnetic materials are attracted to the magnet. (........................)

(B) What happens if ...?

Large magnets spin at a high speed around coiled wires.

....

....

---

3 (A) Choose from column (B) what suits it in column (A) *(5 marks)*

(A)	(B)
1. Electricity	a. is a closed path through which electrons move.
2. Electric circuit	b. is a source of electric charges in the circuit.
3. Electric insulators	c. is a form of energy.
4. Battery	d. is used to open and close the circuit.
	e. are materials that electric charges cannot flow through.

1. .... 2. .... 3. .... 4. ....

(B) Look at the following figures then answer :

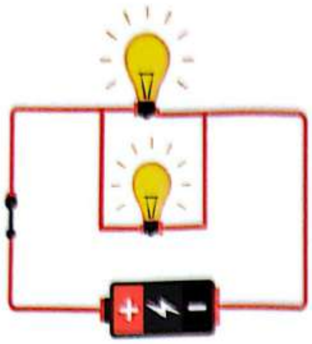


Figure (A)

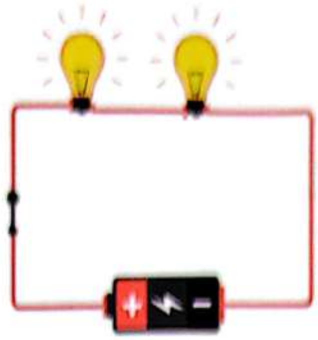


Figure (B)

a. Choose :

1. Which of these figures is a series circuit ? .... [Figure (A) – Figure (B)]
2. Which of these figures is a parallel circuit ? .... [Figure (A) – Figure (B)]

b. Put (✓) or (X) :

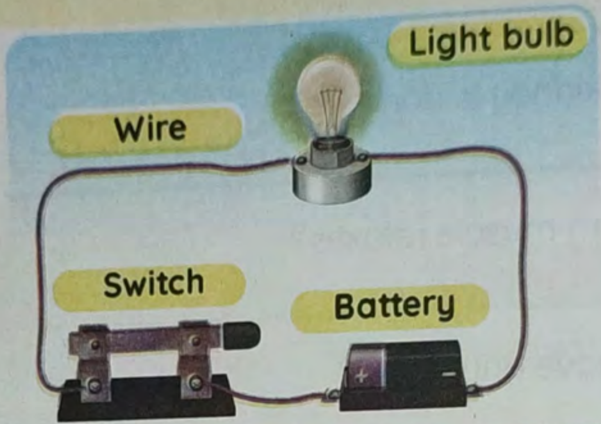
1. If we remove a lamp from the circuit in figure (A), the other lamp will still lit. ( )
2. If the switch in figure (B) is replaced by a metallic paper clip, all lamps will turn off. ( )

Concept 3 Energy as a System

1 Summary of Concept 3

Electric Circuit

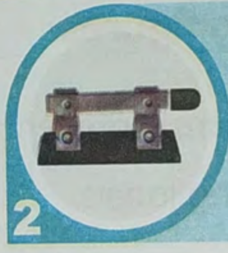
Electric Circuit • It is a closed path that electricity flows through.



The Components of Electric Circuit

Battery
It is a source of energy in the circuit.





Switch
It is a device that help in opening and closin electrical circuits.

Wire
It connects the components of an electric circuit together.





Light bulb
It shows the transfer of electricity.

A switch can be:

1. **Manual**
Such as a wall switch for lights.



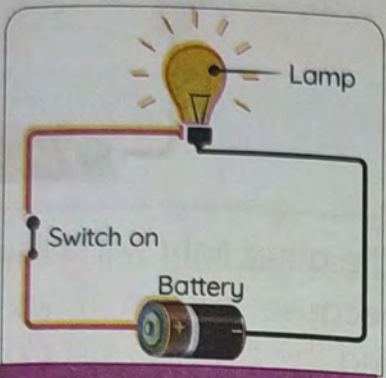
2. **Automatic**
Such as the internal switch on a thermostat



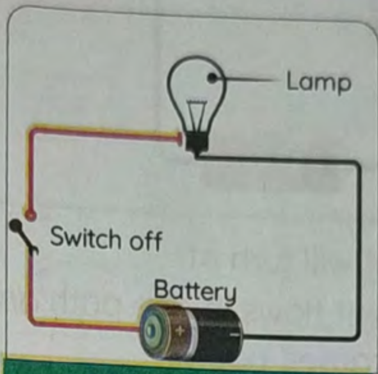
- All parts of an electric circuit must conduct electricity.
- The circuit works as one unit, like a **system** to make electricity flow.
- **Electrical poles** supporting wires outside and the wires inside walls are all examples of **electric circuits**.





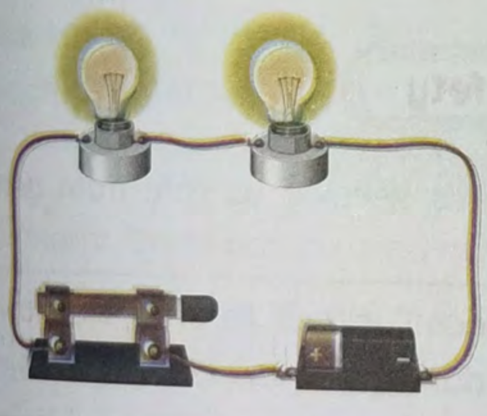
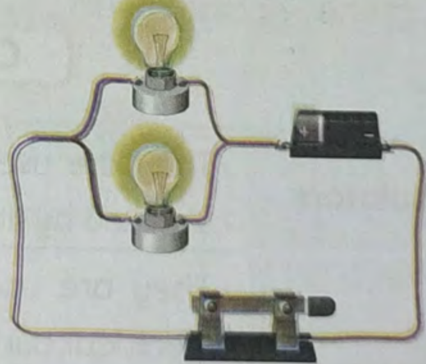


Closed Circuit

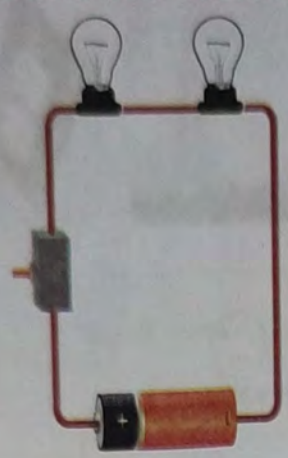
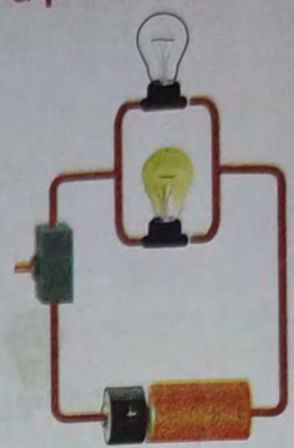


Open Circuit

- **There are two ways of connecting for electric circuits.**

Series Circuit	Parallel Circuit
A way of connection in which lights are connected in **one path**.	A way of connection in which lights are connected by **multiple paths**.
	
Electric current	
Current flows in a **single (one)** path.	Current flows in **multiple** paths.

What happens if... ? One light is turned off

in a series circuit?	in a parallel circuit?
	
The other light will turn off because current flows in one path and the circuit becomes **open**.	The other light will still work because current flows in two path and the circuit is still **closed**

Electric circuit at houses:



- A **parallel circuit** is the type of circuit you would find in your house.
- You can operate a **blender**, **toaster**, and **TV** all at the same time, but if you turn one off, the others will continue to work just fine.

Current Safety

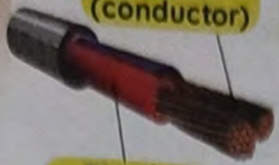
1 Insulators	• They are used to coat wires, keeping us safe from getting shocked by the current.
2 Elecrtic Resistors	• They are used in the electric circuit to limit the flow o electrical current to limit damage to the components of c circuit • Resistors are found in **toasters**, **microwaves**, and **electri stoves**.

Materials can be classified into two types

1 A conductor

A material through which electricity flows easily.

Such as copper and aluminum.



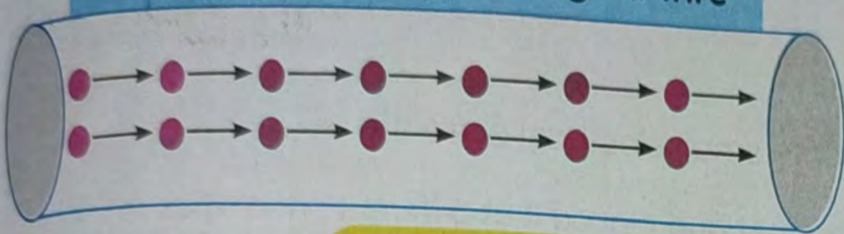
2 An insulator

A material through which electricity does not flow easily.

Such as rubber and plastic.

Electricity • It is the flow of charged particles (electrons) through a wire.

The flow of electrons through a wire



Electrons

They are tiny charged particles that flow in a closed electric.

Generating Electricity

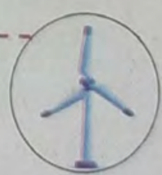
- Most of the world's electricity generation is carried out in **electric power plants** that use a **turbine** to drive **generators**.
- Turbines can run on **renewable** or **non-renewable resources**.



- **Turbine:** It is a device used to drive (spin) a generator..
- **Generator:** A device that changes **kinetic (mechanical)** energy into **electrical** energy.

How does a generator work?

- Different forces can be used to make the magnets spin at a high rate of speed. For example,
  - **Wind-powered turbines** can be used to spin magnets.
  - **Water from a dam** flows across the turbine, causing the magnets to spin.
  - **Fuels, such as oil and coal** are used to make water boil.
    - This creates steam, which causes a turbine to spin.



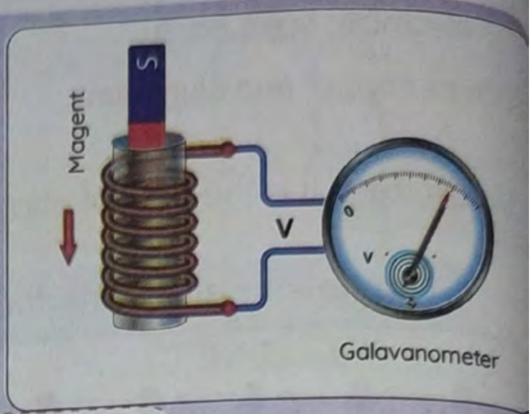


- The spinning magnets create an electrical charge on the surrounding wires and electricity is produced.
- Electricity travels along conductors called power lines into all kinds of electrical equipment in homes, businesses, and factories.

Magnetism and Electricity:

A scientist conducted an experiment

1. He tightly coiled a copper wire around a hollow cylinder.
2. He connected this coil to a galvanometer.



Galvanometer

A device used to indicate small electrical currents.

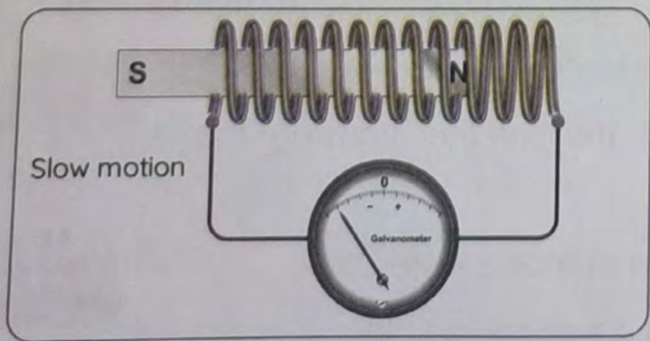
3. He then took a bar magnet and placed it at different proximities in relation to the coil.

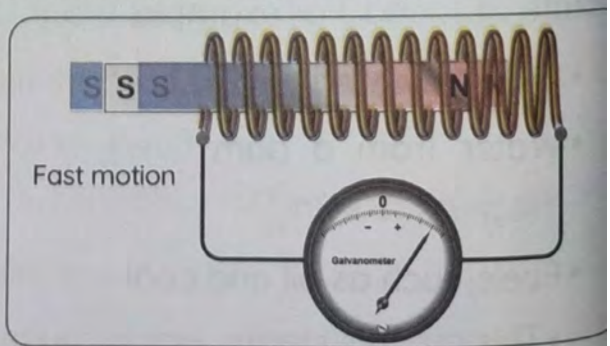
If		Then
The magnet sat at rest away from the coil,	→	the needle of the galvanometer did not move, indicating there was no current flow.
The magnet moved toward and into the cylinder,	→	the needle moved to one side, indicating that there was current flow.

Factors Affect the Induced Current:

1 Speed of Magnet

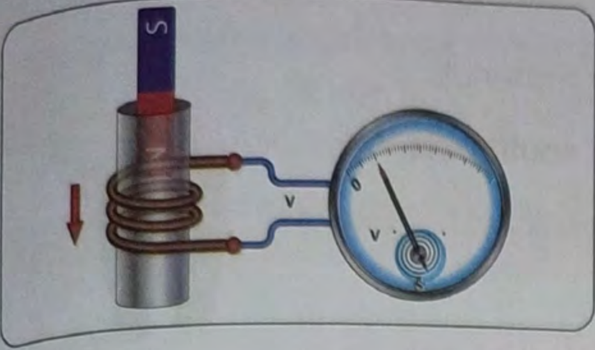
- As the magnet moves faster, the needle moves faster, indicating an increase in the voltage.

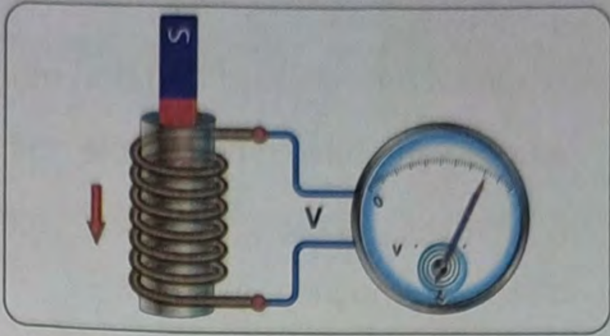




2 Number of Loops

» As the number of coiled loops increases, the needle moves faster, indicating an increase in the voltage.





Where is electromagnetic induction used?

Electromagnetic induction is now used in **electric motors**, **generators**, and **transformers**.

Electromagnetic induction:

It is the process of generating an electric current using a magnet field.

Magnetism and Gravity

1 Gravitational Force

» It is the force that attracts objects with mass downward to the Earth's center.

» **When you throw an apple up into the air?**

It will stop moving upward and fall back to Earth due to gravity.





Factors Affecting Gravity:

1 Mass	• As the mass **increases**, the gravity **increases**.
2 Distance	• As the distance between objects and the center of the Earth **increases**, the gravitational force **decreases** and vice versa.

2 Magnetism

» The force that allows the magnet to **attract** magnetic materials or other magnets towards it.

- Magnets are made of **iron** and **other materials**.
- All magnets have a **north pole** and a **south pole**.
- A magnet attracts magnetic material, but it doesn't affect non-magnetic material.
- A magnet attracts **magnetic materials** that only lie in its **magnetic field**.



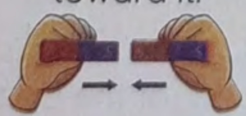
We can classify materials into two types:

P.O.C	Magnetic Materials 	Not-magnetic Materials 
Definition	• They are materials that attracted to magnets	• They are materials that aren't attracted to magnets
Examples	**Iron - Steel - Nickel**	**Copper - Aluminium - Plastic - Carton**

Magnetism allows the magnet to:

1 Attract (pull)

other magnets toward it.



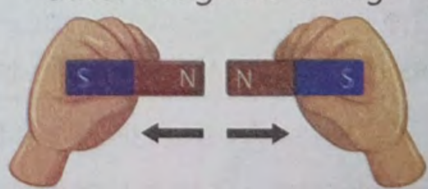
Different poles are attracted to each other.

some materials.



2 Repel (push)

other magnets away.



The same poles are repelling each other.

- Magnets produce a field around them called the **magnetic field**.

Magnetic Field • The space around the magnet in which the effect of magnetic force appears.



- You can allow a magnet to interact with small iron filings.
- The pattern that the iron filings make near the magnet is the outline of the **magnetic field**.

P.O.C	Gravitational Force	Magnetism
Differences	• It attracts and never repels. • Gravity affects all objects that have mass on earth or near it.	• It attracts or repels. • It only attracts specific materials that lie in its magnetic field.
Similarities	• **Both are invisible forces.** G.R - Because we cannot see the **magnetic** field or gravitational force can only observe their effects. • **Both are not-contact forces.** G.R - Because they affect objects without direct contact.	

Invisible force:

A force that we can't see, but we can see its effect.

Not-contact force:

A force that doesn't need objects to touch each other.

The Heart: Natural Pacemaker:



- The heart is an amazing muscle (organ).

Function (Job):

It beats consistently for the duration of our lives.

- **The heart is a natural pacemaker.** G.R
  - Because the pacemaker creates electrical currents that it sends out through the heart, causing the heart to contract.
- **Some people whose pacemakers start to fail need an artificial pacemaker.** G.R
  - To keep the heart beating correctly.

The Artificial Pacemaker:

- A battery-operated device that is inserted into the chest and stimulates the heart muscle to beat at regular intervals for patients who have slow or irregular heartbeats.



- A pacemaker has been in use for over 60 years.
- The artificial pacemaker has a built-in antenna. G R
  - To send information to physicians, so they know how the heat is behaving.
- Pacemakers are becoming smaller too.

2 Definitions of Concept 3

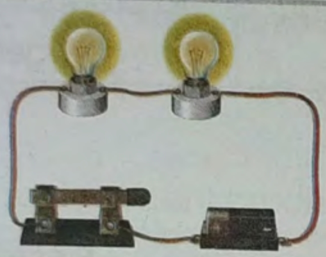
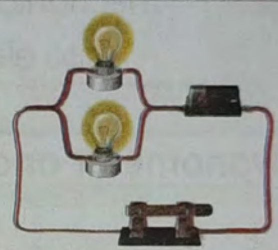
Electricity (Electric current)	It is the flow of charged particles (electrons) through a wire.
Electric circuit	It is a closed path that electricity flows through.
Battery	It is the source of electrical energy in the electric circuit.
Switch	It is the device that helps in opening and closing electrical circuits.
Thermostat	It is the device that has an automatic switch to turn on and off some appliances.
Series circuit	It is the way of connection in which lights are connected in a single path.
Parallel circuit	It is the way of connection in which lights are connected in multiple paths (different branches).
Invisible force	It is the force that we can't see, but we can see its effect.
Non-contact force	It is the force that doesn't need objects to touch each other.
Gravitational force	It is the force that attracts objects with mass downward to the Earth's center.
Magnetic field	It is the space around the magnet where its magnetic force appears.
Magnetic materials	They are materials that are attracted to magnets.

Final Revision

Non-magnetic materials	They are materials that are not attracted to magnets.
Generator	It is the device that changes mechanical (kinetic) energy into electrical energy.
Electrons	They are tiny charged particles flowing in a closed elect circuit.
Conductors	They are the materials that allow electricity to flow through easily.
Insulators	They are the materials that don't allow electricity to flo through easily.
Electric resistors	They are parts of a circuit that limit the flow of electrica current.
Power plants	They're facilities that provide towns and factories with electricity.
Power lines	They are conductors that transport the electricity from power stations to all the city.
Galvanometer	It's a device used to indicate small electrical currents in circuit.
Artificial pacemaker	It's a battery-operated device that is inserted into the chest and stimulates the heart muscle to beat at regula intervals for patients who have a slow or irregular heartbeat.

3 Comparisons of Concept 3

1 Series Circuit and Parallel Circuit

	Series Circuit	Parallel Circuit
Definition	It's a way of connection in which lights are connected in **one path**.	It's a way of connection in which lights are connected in **multiple paths**.
If one bulb burns out,	The other bulb will turn off.	The other bulb will still work.
Figure		

2 Conductors and Insulators

	Conductors	Insulators
Definition	They are the materials that allow electricity to flow through them easily.	They are the materials that don't allow electricity to flow through them easily.
Examples	All metals, such as: Iron – Copper – Aluminum – Lead – Silver	Wood – Plastic – Rubber – Cloth – Paper
Uses	They are used in making electric cords and wires (cables).	They are used in coating electric conductors.

3 Magnetic and Non-magnetic materials

	Magnetic Materials	Non-magnetic Materials
Definition	They are materials that are attracted to magnets.	They are materials that are n attracted to magnets.
Examples	Iron - Nickel - Steel	Copper - Aluminum - Wood Plastic - Rubber

4 Generator and Turbine

	Generator	Turbine
Usage	It is used to convert mechanical (kinetic) energy into electrical energy.	It is used to run huge magne to produce electricity in th generator.

5 Galvanometer and Resistor

	Galvanometer	Electric Resistor
Usage	It is used to detect small electric currents in a circuit.	It is used to limit the flow c electric current in a circuit prevent the damage of its components.

4 Give Reasons for... Concept 3

1 Both gravity and magnetism are invisible forces.
- Because we cannot see them, but we can only observe their effects.

2 Both gravity and magnetism are non-contact forces.
- Because they affect objects without being in contact with them.

3 The electric circuit is considered a system.
- Because it is a group of things that work together to make electricity flow.

4 In a series connection, if one of the bulbs burns out, the other bulbs will be turned off.
- Because the electric current flows in one path.

5 If we put a piece of paperclip near a wire having an electric current, it will be attracted to it.
- Because the electric current produces a magnetic field.

6 If you through an object up in the air, it will return to the ground.
- Due to the gravity that pulls everything down to the Earth's center.

7 The steel pins are magnetic materials.
- Because they are attracted to the magnet.

8 The plastic fork isn't attracted to a magnet.
- Because it is a non-magnetic material.

9 A generator uses magnets and conductors.
- To produce and transport electricity to light homes and operate devices.

10 Touching an uninsulated wire will give you an electric shock and could even kill you.
- Because our bodies contain a lot of water, and water is a good conductor of electricity.

11 Aluminum foils, paperclips, coins and silverware are conductors.
- Because electricity can flow through them easily.

12 Rubber, cloth and wooden spoons are insulators.
- Because electricity cannot flow through them easily.

13 **Electricity is very important in our daily lives.**
- Because we use it to operate many devices.

14 **Electric current doesn't pass through an open electric circuit.**
- Because there's a break in the circuit that makes it uncompleted loop.

15 **Insulators are used to coat wires.**
- Because they keep us safe from getting shocked by electricity as prevent the flow of electricity.

16 **Resistors might be used to slow the flow of electrons through a circuit.**
- To limit the flow of electric current through the circuit.

17 **A parallel circuit is the type of circuit you would find in your house.**
- Because you can operate more than one device at the same time. If turn one off, the others will continue to work just fine.

18 **Heart is a natural pacemaker.**
- Because the heart has its own built-in little pacemaker that creates elec currents and sends them out through the heart, causing the heart to con

19 **An artificial pacemaker is implanted in the chests of some patients.**
- To keep the heart beating regularly.

5 What Happens If...? Concept 3

1 **One light burns out in a series circuit?**
- The circuit is opened (broken). so all light bulbs are turned off.

2 **One light burns out in a parallel circuit?**
- The circuit is still closed, so the other light bulbs are still working.

3 **An electric current flows through a wire?**
- A magnetic field is produced around the wire.

4 **You throw an apple up into the air?**
- It will stop moving upward and fall back to the Earth due to gravity.

5 **You approach the north poles of two magnets with respect to each oth**
- They will repel each other.

6 **You sprinkle iron filings near a magnet on a flat surface?**
- They will make a pattern of its magnetic field.

7 **You approach a magnet to a mixture of sand and iron filings?**
- The magnet only attracts the iron filing, but doesn't attract the sand.

8 **You put a paperclip in the middle between two magnets that have different sizes?**
- It will get attracted to the bigger magnet.

9 **The turbine of the generators spin?**
- It moves the magnets to produce an electric current.

10 **You turn the switch off in the electric circuit?**
- This causes a break in the circuit and stops the flow of electrons.

11 **You turn the switch on in an electric circuit?**
- This allows electrons to move through the circuit.

12 **The turbines of a generator stop spinning or are damaged?**
- It will not generate electricity.

13 **A paperclip is placed in a circuit with a battery and bulb?**
- Electricity will flow, and the bulb will light.

14 **An eraser is placed in a circuit with a battery and bulb?**
- Electricity will not flow, and the bulb will not light up.

15 **A television is connected to a blender in a series circuit?**
- They will be turned on and off together at the same time.

16 **A toaster has no resistors?**
- The toaster will be damaged.

17 **The speed of a magnet moving inside a coil connected to a galvanometer increases?**
- The needle of the galvanometer moves faster, indicating an increase in the voltage.

18 **The number of the coil loops in which a magnet is moving decreases?**
- The needle of the galvanometer moves slower, due to the low induced current.

19 **The natural pacemaker of the heart starts to fail?**
- The heart will not contract correctly, so they need an artificial pacemaker.

6 Revision on Concept 3

1 Choose the correct answer:

1. A/An .... is used to open and close the electric circuit.
   a. wire b. switch c. electric lamp d. battery
2. A series circuit allows the current to flow in .... path(s).
   a. one b. two c. three d. multiple
3. The .... is the space around a magnet where its force appea
   a. magnetic pole b. magnetism
   c. magnetic field d. magnetic material
4. Which magnets are better at attracting objects from a farther dista
   a. Small magnets b. Medium magnets
   c. Large magnets d. Weak magnets
5. .... are used to run electric generators.
   a. Light bulbs b. Turbines c. Iron nails d. Batteries
6. .... change mechanical energy into electrical energy.
   a. Motors b. Electric lamps
   c. Electric fans d. Generators
7. A magnet will attract the scissors if they contain ....
   a. iron b. copper c. plastic d. wood
8. On sprinkling iron filings on a magnet, we can see the ....
   a. mass of its magnetic field b. shape of its poles
   c. pattern of its poles d. pattern of its magnetic fiel
9. The force of the induced current by a moving magnet in a depends on the ....
   a. number of coil loops b. speed of the magnet
   c. number of galvanometers d. a and b
10. The generator produces .... energy.
    a. mechanical b. chemical c. light d. electrical

11 A pacemaker is implanted in the patient's ....

a. stomach b. chest c. pancreas d. liver

12 A small magnet can attract a paperclip at a distance of .... better than a magnet at a distance of 5 cm.

a. 3 cm b. 6 cm c. 10 cm d. 8 cm

13 All the following are electric insulators, except ....

a. rubber b. wood c. copper d. plastic

14 Electric cords are coated with ....

a. copper b. aluminum c. iron d. plastic

15 A .... is used to indicate the current in a circuit depending on the magnetic field.

a. resistor b. galvanometer c. battery d. generator

16 The magnetic field produced when an electric current passes through a wire is .... that in a wire wrapped around a metal core.

a. weaker than b. equal to c. stronger than d. typical to

17 A .... is used to decrease the flow of electrons passing in an electric circuit.

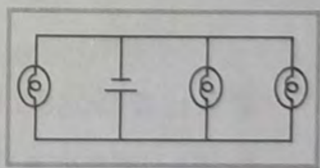
a. resistor b. galvanometer c. turbine d. battery

18 A pacemaker is very helpful for people suffering from ....

a. diabetes b. asthma
c. heart problems d. hearing problems

19 If one bulb from the opposite circuit is burnt out, ...

a. the other bulbs will turn off
b. the other bulbs will stay on
c. the battery will become stronger
d. no correct answer



2 Put (✓) or (✗):

1 The magnet has two poles. ( )

2 Electricity can't be related to magnetism. ( )

3 Steel pins are considered conductors. ( )

4 Electrons must be static to produce a magnetic field. ( )

5 Water flowing on a dam can be used to move the turbines of a generator. (

6 An insulator resists the flow of electricity. (

7 In a generator, many large magnets spin at a slow speed. (

8 The battery is the source of electric current in the electric circuit. (

9 The heart is a bone that has its own built-in pacemaker. (

10 The force of a magnet depends on the size of the magnetic material. (

11 By increasing the loops of a coil in which a magnet is moving, it generates more induced current. (

12 As the distance between an object and the Earth's surface increases, the gravity increases. (

13 Magnets are used in motors and computers. (

14 Power lines bring an electric current to the battery. (

15 Nickel is attracted to the magnet as it is a non-magnetic material. (

16 Magnets are made of iron only. (

3 Write the scientific term:

1 It's an injury that results from passing an electric current through th human body.

2 They are materials that are attracted to a magnet.

3 It's a facility that is used to generate electricity for homes, streets ar factories.

4 It is a closed loop for transmitting an electric current.

5 It's a device that has an automatic internal switch.

6 They're tiny charged particles that flow through an electric circuit.

7 It's a device that converts mechanical energy into electrical energy.

8 It's the type of a circuit you would find in your house.

9 It's a device used to detect a small electrical current in a circuit.

10 It's a device used to help people with irregular or slow heartbeats.

11 They're materials that allow electricity to flow through freely.

12 It's a part of the galvanometer that indicates the presence of voltage in the circuit.

13 It's the force that allows the magnet to attract or repel certain materials or other magnets towards itself.

14 They're materials that don't allow an electric current to flow though easily.

15 It is the movement of charged particles through a conducting wire.

4 Complete the following sentences using the words between the brackets:

A

(turbines - series - steam - magnetic field - heartbeats - electric charges - parallel)

1 In a .... circuit, each bulb has its own circuit.

2 When water boils, it produces .... that causes .... to rotate.

3 In a .... circuit, the electric current passes through only one path.

4 A pacemaker helps patients who have irregular ....

5 The electric current that passes through a wire has a ....

B

(work - huge magnets - plastic - turbines - hands - electric charges)

1 In a generator, the spinning turbines move .... that create .... on the wire.

2 The electrons exert a .... during flowing through the electric circuit.

3 Electric wires are wrapped with .... to prevent the flow of electricity to our ....

5 Cross the odd word out:

1 Nickel - Steel - Silverware - Iron

2 Plastic - Rubber - Iron - Wood

3 Aluminum - Iron - Copper - Cloth

6 Choose from column (A) what suits it in column (B):

A

Column (A)	Column (B)
1 Iron	a. is a non-magnetic material that conducts electricity.
2 Copper	b. is found in a pacemaker.
3 Built-in antenna	c. is a magnetic material that conducts electricity.

1 .... 2 .... 3 ....

B

Column (A)	Column (B)
1 Earth	a. is an invisible and non-contact force.
2 Electromagnetic induction	b. flows through a closed electric circuit.
3 Gravity	c. is used in electric motors and generators
4 Electric current	d. has more gravitational force than that of the moon.

1 .... 2 .... 3 .... 4 ....

7 Classify the following objects into electric conductors and insulators:

(Copper - Plastic - Rubber - Silver necklace - Aluminum - Human body - Cloth - Wood - Iron)

Electric Conductors	Electric Insulators

8 Look at the following figures, then answer the questions below:

A

1. Figure (.......) represents a closed electric circuit because ....
2. What happens if you removed the battery from figure (b)?

....

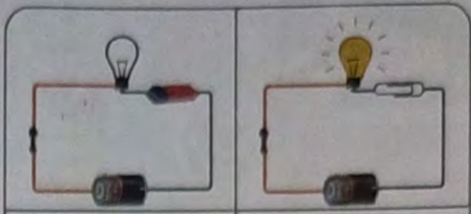
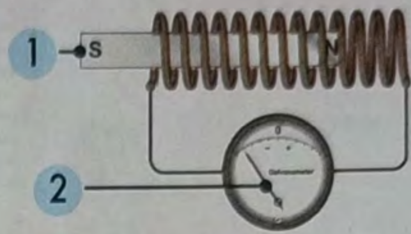


Figure a | Figure b

B Answer the following:

1. Number (1) represents: ....
2. Number (2) represents: ....
3. If we push and pull (1) inside the hollow cylinder, ... force will be produced.



9 Give reasons for:

1. Ann electrical fire increases while extinguishing it with water.
2. An electric current doesn't pass through an open electric circuit.
3. In a series connection, if one of the bulbs burns out, the other bulbs are turned off.
4. Resistors might be used in an electric circuit.
5. If you throw an object up in air, it will return to the ground.
6. A galvanometer needle deflects on moving a magnet inside a coil.

10 What happens if:

1. You approach a magnet to a mixture of copper filings and steel pins?
2. The turbines of a generator stop spinning?
3. A person is exposed to an electric shock?
4. A bulb is burned out in a series circuit of 5 bulbs?
5. You move a magnet inside a coiled wire?
6. Yoy increase the speed of a magnet moving inside a coiled wire (according to the galvanometer's needle)?

Concept 2 Questions

Lesson 4

Choose the correct answer :

1. The systems of the human body get their needed energy from …………….
   a. the sun b. water c. food d. carbon dioxide

2. All the following are from the nutrients that the food contains, except ……………….
   a. carbohydrates b. oxygen gas c. fats d. proteins

3. The system which converts the complex food into simpler substances that the body can use for energy and growth is the …………….. system.
   a. respiratory b. nervous c. circulatory d. digestive

4. You can use your …………….. muscles to help the teeth chew the food.
   a. eye b. cardiac c. jaw d. hand

5. The system which helps the digestive system during chewing the food by secreting enzymes in your mouth is the ………………. system.
   a. endocrine b. circulatory c. respiratory d. nervous

6. The function of saliva inside your mouth is ………………….
   a. cutting up the food into smaller parts
   b. softening the food and breaking it down
   c. transporting the food into stomach

d. transporting the food through body organs.

7. The organ which belongs to the digestive system and secretes fluids contain an acid and some enzymes is the ……………………………..
   a. esophagus b. stomach c. small intestine d. mouth

8. In small intestine, …………………… help(s) in breaking down of food by secreting some enzymes.
   a. pancreas only c. pancreas and gallbladder
   b. gallbladder only d. pancreas and lungs

9. Absorption of nutrients inside the body starts in the ……………..…. organ.
   a. large intestine c. heart
   b. small intestine d. stomach

10. Walls of small intestine contain …………………….. which responsible for absorbing nutrients of digested food.
    a. blood vessels b. hairs c. glands d. nephrons

11. Blood carries ………………… formed inside small intestine to all the body organs.
    a. feces b. undigested food c. bones d. nutrients

12. The large intestine absorbs ……………. from the undigested food.
    a. nutrients b. water c. blood d. urea

13. The part of large intestine which stores the feces until it leaves the body is the …………………

a. rectum b. colon c. esophagus d. anus

14. The organs which can store glucose and convert it into glycogen are ………………….
  a. liver and pancreas
  b. muscles and stomach
  c. esophagus and stomach
  d. liver and muscles

15. The system which helps the digestive system in transporting the nutrients to all different body organs is the …………… system.
  a. nervous b. respiratory c. circulatory d. excretory

16. The body gets rid of waste materials by ……………. process.
  a. digestion b. excretion c. respiration d. sensation

17. The excretion process is necessary to ……….
  a. digest the food that you eat.
  b. allow your body to move.
  c. transport the nutrients inside your body.
  d. remove the waste products from your body.

18. All the following are responsible for excretion process, except ……………..
  a. digestive system
  b. skin
  c. respiratory system
  d. urinary system

19. The organ which is responsible for secreting sweat is the …………
  a. esophagus b. stomach c. skin d. kidney

20. All the following are from the waste materials which are produced by your body, <u>except</u> ………….
  a. urine b. oxygen gas c. carbon dioxide d. sweat

21. Among the organs which belong to urinary system are ………..

a. stomach and kidneys
b. ureters and gallbladder
c. kidneys and bladder
d. urethra and heart

22. The two kidneys play an important role in the filtration of ……………. inside your body.

a. water b. enzyme c. acid d. blood

23. The blood which carries the waste materials, enters each kidney through a large …………..

a. vein b. artery c. blood capillary d. ureter

24. Urea is formed due to the breaking down of ……… inside the body cells.

a. Carbohydrates b. fats c. acids d. proteins

25. The tube which transports the urine from the kidney to the bladder is the ……………..

a. vein b. urethra c. ureter d. artery

26. The process of expelling urine from the body is called ……………… process.

a. urination b. respiration c. digestion d. sensation

Put (√) or (x):

1- Systems get their needed energy from the food we eat. ( )

2- The simple substances must be converted into complex nutrients to be used by the body cells. ( )

3- Digestion begins when the food enters esophagus. ( )

4- Saliva is a liquid which is secreted by endocrine system inside your mouth. (   )

5- The acid and enzymes which are secreted inside stomach lead to more breaking down of food. (   )

6- Inside large intestine, enzymes which are secreted from pancreas and gallbladder help in the chemical breakdown of food. (   )

7- Absorption of digested food starts in the small intestine. (   )

8- The digested food enters the colon as a soupy mixture. (   )

9- Colon absorbs most of water from the undigested food that leaves the body. (   )

10- The feces leave the body through a bony opening known as anus. (   )

11- Circulatory system transports the digested food to different body organs. (   )

12- All nutrients that are absorbed from small intestine are stored as fats inside the body. (   )

13- Glycogen is converted into glucose and stored in liver and muscles. (   )

14- When your body needs energy, liver and muscles convert glycogen into glucose again. (   )

15- Excretion process is necessary to convert complex food into simpler substances. ( )

16- If your body doesn't get rid of waste, you will be healthy. ( )

17- The main waste product which is expelled by respiratory system is the urea. ( )

18- The two kidneys remove waste materials from the blood. ( )

19- Nephron helps in the filtration of blood from urea. ( )

20- Urine is expelled outside the body through urethra. ( )

21- Blood cells and proteins are too small, so they can pass through the nephrons of kidneys. ( )

Write the scientific term of each of the following:

- The system which converts the complex food into simpler substances that the body can use to get energy. (………………………………)
- The process of breaking down the complex food into simpler substances. (…………………………………)
- A liquid in your mouth contains an enzyme which helps in digestion process. (……………………)
- An organ in which absorption of nutrients starts.

(………………………)

- The organ which absorbs most of water from the undigested food. (……………………...)
- The last part of large intestine that stores the feces until it leaves the body. (……………………………….)
- A substance that is stored in liver and muscles, then converted into glucose when your body needs energy.

  (……………………………….)
- It is a system that is responsible for storing and getting rid of waste materials produced from cells.

  (………………………………….)
- It is the process of removing the waste products resulting from burning food inside the body cells through their membranes. (………………………………….)
- The organ which helps in excretion of sweat through the pores that are found in it. (………………………………….)
- The system that is responsible for excretion of carbon dioxide gas. (…………………………………...)
- It is a microscopic filter that is found in the two kidneys and filters the blood from waste materials.

  (……………………………….)
- A substance which is formed due to the breakdown of proteins inside the body cells. (………………………………)

- It is the process of expelling urine from the body.

(…………………………………………)

Complete the following sentences:

1) The food we eat contains different nutrients such as ………………………… , …………………….. and ……………………..
2) Your body cells can use simple substances that are converted from complex …………….. to get their needed ………………. to do their functions.
3) The system which helps your teeth and jaw move to chew the food is the ………………… system.
4) Stomach contains an ………………… and some ………………….. that lead to more food breakdown.
5) Inside small intestine, …………………….. and …………………….. secrete enzymes to help in the chemical breakdown of food.
6) After completing the digestion of food, the walls of …………….. absorb the nutrients through …………………….. that carry them to all the body parts.
7) Undigested food passes to …………………….. intestine which absorbs most of …………………… from it, leaving the solid waste that is known as …………………… or …………………………..
8) The muscular opening that the feces passes through it to outside the body is known as ……………………..

9) Cells can use …………………… sugar at once to get their needed energy, and this sugar can be converted into ……………. and stored in liver and ………………………..

10) Excretion process happens when …….…………….. system collects the waste materials produced by ……………….. and expels them outside the body.

11) Some waste products leave your body in the form of ………………… through your skin.

12) Respiratory system removes …………………….. gas from the body as a waste product.

13) Urinary system removes waste material from the blood in the form of ……………………..

14) Blood which carries waste materials reach the kidney through a large ………………………..

15) Filtration of blood occurs inside the ……….……… by the help of a microscopic filter known as ………………………..

16) When you eat a piece of meat, proteins are broken down and form a waste material known as ………………………..

17) Urine is composed of …………………, other waste products and ……………………..

18) Urine leaves each kidney through …………………….. and is collected in the …………………….. until it is expelled outside the body.

19) Blood cells and ………………….. are ………………. in size, so they cannot pass through nephrons, and stay in the body.

__Give reasons for:__

- The body needs to convert complex food into simpler substance.

………………………………………………………………………………………………

………………………………………………………………………………………………

- Saliva plays an important role in digestion of food inside the mouth.

………………………………………………………………………………………………

………………………………………………………………………………………………

- Stomach secretes a digestive fluid when the food reach it.

………………………………………………………………………………………………

………………………………………………………………………………………………

- Walls of small intestine contain blood vessels.

………………………………………………………………………………………………

………………………………………………………………………………………………

- Undigested food becomes solid wastes inside the large intestine.

………………………………………………………………………………………………

………………………………………………………………………………………………

- The liver and muscles convert the stored glycogen into glucose sugar.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

- Importance of excretion process to your body.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

- The digestive system doesn't share in excretion process.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

- The two kidneys contain many nephrons.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

- Formation of urea inside the body of human.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

What happens if…:

❖ Complex nutrients don't convert into simple substances inside your body.

……………………………………………………………………………………………………

……………………………………………………………………………………………

❖ Saliva is not secreted during chewing the food inside your mouth.

……………………………………………………………………………………………

……………………………………………………………………………………………

❖ Pancreas and gallbladder don't secrete their enzymes in small intestine.

……………………………………………………………………………………………

……………………………………………………………………………………………

❖ Your body doesn't get rid of waste.

……………………………………………………………………………………………

……………………………………………………………………………………………

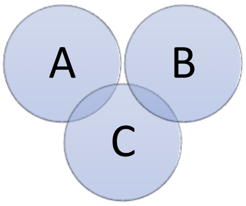
❖ The blood that carries waste materials passes through nephrons of the two kidneys.

……………………………………………………………………………………………

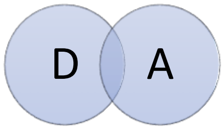
……………………………………………………………………………………………

<u>Look at the following diagrams that represent the sharing of some body systems to do some processes, then use the words below to complete the following sentences:</u>

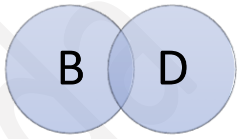
(**respiratory system – skin - urinary system - circulatory system**)



Excretion process



Transportation of waste materials and urination

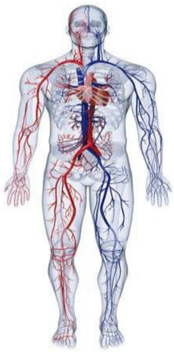
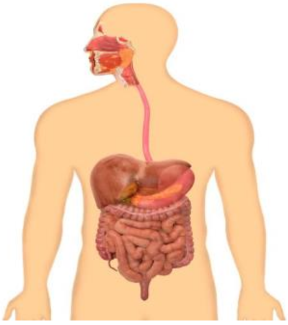


Respiration process and transportation of gases

1. Letter (A) represents …………………
2. Letter (B) represents ……………………
3. Letter © represents …………………….
4. Letter (D) represents …………………….

<u>Write each of the following organs below the system that belongs to:</u>

(**Heart - Lungs - Kidneys – Stomach**)

……………………..   ……………………..   ……………………..   ……………………..

Lesson 5

Choose the correct answer :

1. Engineers design special devices to work instead of …………………….. organ which filter the blood from waste materials.
   a. stomach   b. heart   c. kidney   d. lung

2. Nephrons play an important role in ……………………
   a. secreting hormones to control the body functions.
   b. controlling the movement of body from place to another.
   c. breaking down the complex food into simple nutrients.
   d. filtering the blood from waste materials.

3. Among the substances which cannot pass through the kidneys' nephrons are ……………………….
   a. blood cells and urea   c. proteins and urea
   b. blood cells and proteins   d. water and urea

4. Urination process happens by the help of …………………. system.
   a. digestive   b. urinary   c. respiratory   d. skeletal

5. The two kidneys remove waste materials as …………………, and expel them in the form of urine.
   a. water and urea
   b. urea and blood cells
   c. water and proteins
   d. proteins and blood cells

Put (√) or (x):

1- Kidneys are considered as a filtering system for the blood. (   )

2- People whose kidneys are not working properly must use other devices to filter their blood from waste. (   )

3- Proteins can pass through nephrons during filtration of blood in the two kidneys. (   )

4- Studying a kidney model can save time, money and effort. (   )

5- The two kidneys remove waste materials from undigested food which come out in the form of urine. (   )

Complete the following sentences using the words below:

(**kidney model - proteins – blood - urine - nephrons – urea**)

2) People whose kidneys are not working well, their …………………….. cannot be filtered well.

3) Some substances can pass through nephrons as …………………., while other substances cannot pass through nephrons as ……………………

4) The microscopic filters which are found inside the two kidneys are called ……………………..

5) We can save people's life when studying a …………………… instead of a real kidney.

6) Waste materials that are removed by the help of urinary system are coming in the form of ………………………….

Give a reason for :

- Blood cells and proteins cannot pass through the kidney's nephrons.

………………………………………………………………………………………………

………………………………………………………………………………………………

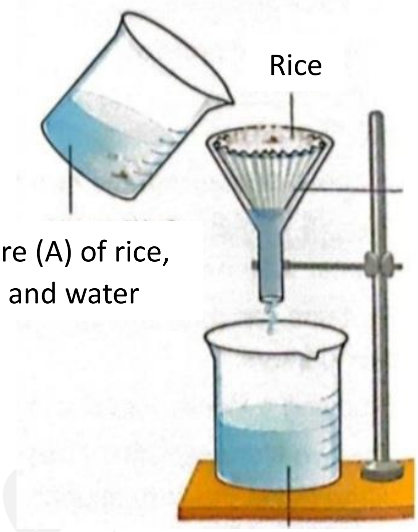
What happens if…:

- The blood does not pass through the two kidneys during its circulation inside the human body.

………………………………………………………………………………………………

………………………………………………………………………………………………

Look at the opposite figure, then choose the correct answer from those between brackets:



- The filter in the opposite figure is like ………. organ in the urinary system.
  (stomach – kidney)

- Mixture (A) is like ……….. which is found in the body.
  (blood before filtering - blood after filtering)

- Mixture (B) is like ……………. that comes out from the body.
  (filtered blood - urine)

- Rice in the opposite figure is like ………. which cannot pass through nephrons during filtration of blood.
  (proteins – urea)

Lesson 6

Choose the correct answer:

1. Diabetes disease occurs due to a disturbance in one organ of ………………… system.
   a. respiratory b. nervous c. endocrine d. urinary

2. The organ which is responsible for secreting insulin hormone is the …………………
   a. gallbladder b. pancreas c. liver d. stomach

3. Insulin hormone is responsible for regulating the level of …………………….. in blood.
   a. proteins   b. fats   c. water   d. sugar

4. Pancreas belongs to …………….. system and its secretions help in completing ……………………… process.
   a. endocrine – digestion   c. circulatory - respiration
   b. digestive – urination   d. endocrine - sensation

5. People who suffer from diabetes can use the insulin pump device that injects the body automatically with …………..
   a. sugar   b. water   c. insulin   d. carbohydrate

<u>Put (√) or (X):</u>

1- Diabetes disease is one of the disorders of the respiratory system. (   )
2- Pancreas secretes hormone to regulate sugar level in the blood. (   )
3- If pancreas cannot do its function correctly, the sugar level in blood doesn't affect. (   )
4- The body uses sugar to get its needed energy. (   )
5- The insulin pump device helps diabetics control the water level in the blood with automatic injections of insulin. (   )
6- Researchers are working to develop an artificial pancreas instead of the insulin pump device. (   )

Write the scientific term of each of the following:

- The organ that is responsible for regulating the sugar level in blood. (…………………………….)
- A hormone that controls the level of sugar in the human blood. (…………………………………….)
- The system which helps in regulating sugar level in the blood by secreting a specific hormone. (…………………………………………….)
- A device that is used by diabetics to help them control the blood sugar levels with automatic injections of insulin. (……………………………………….)
- A disease that is resulting from the disorder of secreting insulin hormone by pancreas. (………………………………….)

Complete the following sentences using the words below:

(**insulin pump – endocrine - pancreas – blood – diabetes - insulin - energy**)

2) People that have a problem in secreting insulin hormone will be infected by ………………….. disease.
3) Pancreas is one of the organs of …………………… system that produces ………………….. hormone.
4) Insulin regulates the sugar level in the …………………….

5) Diabetics can control the blood sugar levels by using ……………………………. device automatic injects the body with insulin.
6) Researchers are working to develop an artificial ……………. to pump insulin internally inside the human body.
7) The human body uses sugar to get its needed ………………… for doing all vital activities.

__Give a reason for :__

- Diabetics must give themselves regular shots of insulin.

…………………………………………………………………………………………………

…………………………………………………………………………………………………

__What happens if…:__

- ❖ Pancreas doesn't make its function correctly.

…………………………………………………………………………………………………

…………………………………………………………………………………………………

Concept 2 Answers

Lesson 4

Choose the correct answer :

1. The systems of the human body get their needed energy from …………….
   a. the sun   b. water   c. food   d. carbon dioxide

2. All the following are from the nutrients that the food contains, except ……………….
   a. carbohydrates   b. oxygen gas   c. fats   d. proteins

3. The system which converts the complex food into simpler substances that the body can use for energy and growth is the ……………. system.
   a. respiratory   b. nervous   c. circulatory   d. digestive

4. You can use your ……………. muscles to help the teeth chew the food.
   a. eye   b. cardiac   c. jaw   d. hand

5. The system which helps the digestive system during chewing the food by secreting enzymes in your mouth is the ………………. system.
   a. endocrine   b. circulatory   c. respiratory   d. nervous

6. The function of saliva inside your mouth is …………………
   a. cutting up the food into smaller parts
   b. softening the food and breaking it down
   c. transporting the food into stomach
   d. transporting the food through body organs.

7. The organ which belongs to the digestive system and secretes fluids contain an acid and some enzymes is the ……………………………
   a. esophagus   b. stomach   c. small intestine   d. mouth

8. In small intestine, ………………… help(s) in breaking down of food by secreting some enzymes.
   a. pancreas only   c. pancreas and gallbladder
   b. gallbladder only   d. pancreas and lungs

9. Absorption of nutrients inside the body starts in the ……………… organ.
   a. large intestine   c. heart
   b. small intestine   d. stomach

10. Walls of small intestine contain ……………………. which responsible for absorbing nutrients of digested food.
   a. blood vessels   b. hairs   c. glands   d. nephrons

11. Blood carries ………………. formed inside small intestine to all the body organs.
   a. feces   b. undigested food   c. bones   d. nutrients

12. The large intestine absorbs ……………. from the undigested food.
   a. nutrients   b. water   c. blood   d. urea

13. The part of large intestine which stores the feces until it leaves the body is the ………………..
   a. rectum   b. colon   c. esophagus   d. anus

14. The organs which can store glucose and convert it into glycogen are ………………….
   a. liver and pancreas   c. esophagus and stomach

b. muscles and stomach   d. liver and muscles

15. The system which helps the digestive system in transporting the nutrients to all different body organs is the …………… system.

a. nervous   b. respiratory   c. circulatory   d. excretory

16. The body gets rid of waste materials by ……………. process.

a. digestion   b. excretion   c. respiration   d. sensation

17. The excretion process is necessary to ……….

a. digest the food that you eat.
b. allow your body to move.
c. transport the nutrients inside your body.
d. remove the waste products from your body.

18. All the following are responsible for excretion process, except …………….

a. digestive system   c. respiratory system
b. skin   d. urinary system

19. The organ which is responsible for secreting sweat is the …………

a. esophagus   b. stomach   c. skin   d. kidney

20. All the following are from the waste materials which are produced by your body, except ………….

a. urine   b. oxygen gas   c. carbon dioxide   d. sweat

21. Among the organs which belong to urinary system are ……….

a. stomach and kidneys   c. kidneys and bladder
b. ureters and gallbladder   d. urethra and heart

22. The two kidneys play an important role in the filtration of ……………. inside your body.

a. water b. enzyme c. acid **d. blood**

23. The blood which carries the waste materials, enters each kidney through a large …………..

a. vein **b. artery** c. blood capillary d. ureter

24. Urea is formed due to the breaking down of ……… inside the body cells.

a. Carbohydrates b. fats c. acids **d. proteins**

25. The tube which transports the urine from the kidney to the bladder is the ……………..

a. vein b. urethra **c. ureter** d. artery

26. The process of expelling urine from the body is called ……………… process.

a. urination b. respiration c. digestion d. sensation

Put (√) or (x):

1- Systems get their needed energy from the food we eat. (√)
2- The simple substances must be converted into complex nutrients to be used by the body cells. (X)
3- Digestion begins when the food enters esophagus. (X)
4- Saliva is a liquid which is secreted by endocrine system inside your mouth. (√)
5- The acid and enzymes which are secreted inside stomach lead to more breaking down of food. (√)
6- Inside large intestine, enzymes which are secreted from pancreas and gallbladder help in the chemical breakdown of food. (X)
7- Absorption of digested food starts in the small intestine.

(√)

8- The digested food enters the colon as a soupy mixture. (X)

9- Colon absorbs most of water from the undigested food that leaves the body. (√)

10- The feces leave the body through a bony opening known as anus. (X)

11- Circulatory system transports the digested food to different body organs. (√)

12- All nutrients that are absorbed from small intestine are stored as fats inside the body. (X)

13- Glycogen is converted into glucose and stored in liver and muscles. (X)

14- When your body needs energy, liver and muscles convert glycogen into glucose again. (√)

15- Excretion process is necessary to convert complex food into simpler substances. (X)

16- If your body doesn't get rid of waste, you will be healthy. (X)

17- The main waste product which is expelled by respiratory system is the urea. (X)

18- The two kidneys remove waste materials from the blood. (√)

19- Nephron helps in the filtration of blood from urea. (√)

20- Urine is expelled outside the body through urethra. (√)

21- Blood cells and proteins are too small, so they can pass through the nephrons of kidneys. (X)

<u>Write the scientific term of each of the following:</u>

- The system which converts the complex food into simpler substances that the body can use to get energy. (**digestive system**)

- The process of breaking down the complex food into simpler substances. (**digestion process**)
- A liquid in your mouth contains an enzyme which helps in digestion process. (**saliva**)
- An organ in which absorption of nutrients starts. (**small intestine**)
- The organ which absorbs most of water from the undigested food. (**large intestine**)
- The last part of large intestine that stores the feces until it leaves the body. (**rectum**)
- A substance that is stored in liver and muscles, then converted into glucose when your body needs energy. (**glycogen**)
- It is a system that is responsible for storing and getting rid of waste materials produced from cells. (**excretory system**)
- It is the process of removing the waste products resulting from burning food inside the body cells through their membranes. (**excretion process**)
- The organ which helps in excretion of sweat through the pores that are found in it. (**skin**)
- The system that is responsible for excretion of carbon dioxide gas. (**respiratory system**)
- It is a microscopic filter that is found in the two kidneys and filters the blood from waste materials. (**nephron**)
- A substance which is formed due to the breakdown of proteins inside the body cells. (**urea**)
- It is the process of expelling urine from the body. (**urination process**)

Complete the following sentences:

1) The food we eat contains different nutrients such as **carbohydrates** , **fats** and **proteins**.

2) Your body cells can use simple substances that are converted from complex **food** to get their needed **energy** to do their functions.
3) The system which helps your teeth and jaw move to chew the food is the **muscular (musculoskeletal)** system.
4) Stomach contains an **acid** and some **enzymes** that lead to more food breakdown.
5) Inside small intestine, **pancreas** and **gallbladder** secrete enzymes to help in the chemical breakdown of food.
6) After completing the digestion of food, the walls of **small intestine** absorb the nutrients through **blood vessels** that carry them to all the body parts.
7) Undigested food passes to **large** intestine which absorbs most of **water** from it, leaving the solid waste that is known as **feces** or **stool**.
8) The muscular opening that the feces passes through it to outside the body is known as **anus**.
9) Cells can use **glucose** sugar at once to get their needed energy, and this sugar can be converted into **glycogen** and stored in liver and **muscles**.
10) Excretion process happens when **excretory** system collects the waste materials produced by **cells** and expels them outside the body.
11) Some waste products leave your body in the form of **sweat** through your skin.
12) Respiratory system removes **carbon dioxide** gas from the body as a waste product.
13) Urinary system removes waste material from the blood in the form of **urine**.
14) Blood which carries waste materials reach the kidney through a large **artery**.
15) Filtration of blood occurs inside the **kidneys** by the help of a microscopic filter known as **nephron**.
16) When you eat a piece of meat, proteins are broken down and form a waste material known as **urea**.

17) Urine is composed of **urea**, other waste products and **water**.

18) Urine leaves each kidney through **ureter** and is collected in the **bladder** until it is expelled outside the body.

19) Blood cells and **proteins** are **large** in size, so they cannot pass through nephrons, and stay in the body.

Give reasons for:

- The body needs to convert complex food into simpler substance.
  - **Because the body cells use this simpler substance to get energy and grow.**

- Saliva plays an important role in digestion of food inside the mouth.
  - **Because saliva can easily soften the food and starts the chemical breakdown of food.**

- Stomach secretes a digestive fluid when the food reach it.
  - **To allow more food breakdown.**

- Walls of small intestine contain blood vessels.
  - **To carry the digested food (nutrients) to all body parts after completing digestion process.**

- Undigested food becomes solid wastes inside the large intestine.
  - **Because large intestine (colon) absorbs most of water from the undigested food.**

- The liver and muscles convert the stored glycogen into glucose sugar.
  - **To provide the body with its needed energy.**

- Importance of excretion process to your body.
  - **Because the excretory system collects the waste materials produced by cells and remove them from the body to keep the body healthy.**

- The digestive system doesn't share in excretion process.
  - **Because it doesn’t work on the waste materials produced from burning food inside the body cells.**

- The two kidneys contain many nephrons.
  - **To filter the blood and remove harmful substances from the body.**

- Formation of urea inside the body of human.
  - **Due to the breakdown of proteins inside the body cells.**

<u>What happens if…:</u>

- Complex nutrients don't convert into simple substances inside your body.
  - **They cannot be used by body cells to get energy to grow.**

- Saliva is not secreted during chewing the food inside your mouth.
  - **The food cannot be easily softened and chemical breakdown of food will not happen.**

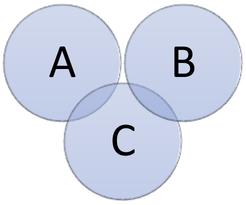
- Pancreas and gallbladder don't secrete their enzymes in small intestine.
  - **The chemical breakdown of food will not happen.**

- Your body doesn't get rid of waste.
  - **The body will get sick.**

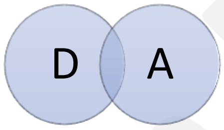
❖ The blood that carries waste materials passes through nephrons of the two kidneys.
   - **The blood will be filtered from harmful substances.**

<u>Look at the following diagrams that represent the sharing of some body systems to do some processes, then use the words below to complete the following sentences:</u>

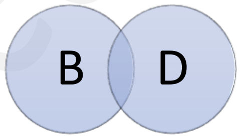
(**respiratory system – skin - urinary system - circulatory system**)



Excretion process



Transportation of waste materials and urination process



Respiration process and transportation of gases

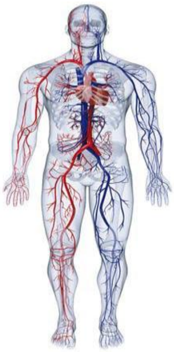
1. Letter (A) represents **<u>urinary system</u>**.
2. Letter (B) represents **<u>respiratory system</u>**.
3. Letter © represents **<u>skin</u>**.
4. Letter (D) represents **<u>circulatory system</u>**.

<u>Write each of the following organs below the system that belongs to:</u>

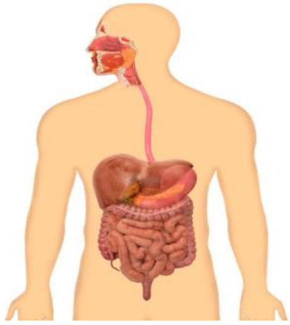
(**Heart - Lungs - Kidneys – Stomach**)



kidneys



Heart



Stomach



Lungs

Lesson 5

Choose the correct answer :

1. Engineers design special devices to work instead of ……………………. organ which filter the blood from waste materials.
   a. stomach b. heart **c. kidney** d. lung

2. Nephrons play an important role in ……………………
   a. secreting hormones to control the body functions.
   b. controlling the movement of body from place to another.
   c. breaking down the complex food into simple nutrients.
   d. filtering the blood from waste materials.

3. Among the substances which cannot pass through the kidneys' nephrons are ……………………….
   a. blood cells and urea c. proteins and urea
   b. blood cells and proteins d. water and urea

4. Urination process happens by the help of ………………… system.
   a. digestive **b. urinary** c. respiratory d. skeletal

5. The two kidneys remove waste materials as ………………..,
   and expel them in the form of urine.
   a. water and urea
   b. urea and blood cells
   c. water and proteins
   d. proteins and blood cells

Put (√) or (x):

1- Kidneys are considered as a filtering system for the blood. (√)

2- People whose kidneys are not working properly must use other devices to filter their blood from waste. (√)

3- Proteins can pass through nephrons during filtration of blood in the two kidneys. (X)

4- Studying a kidney model can save time, money and effort. (√)

5- The two kidneys remove waste materials from undigested food which come out in the form of urine. (X)

Complete the following sentences using the words below:

(**kidney model - proteins – blood - urine - nephrons – urea**)

1) People whose kidneys are not working well, their **blood** cannot be filtered well.
2) Some substances can pass through nephrons as **urea** while other substances cannot pass through nephrons as **proteins**.
3) The microscopic filters which are found inside the two kidneys are called **nephrons**.
4) We can save people's life when studying a **kidney model** instead of a real kidney.
5) Waste materials that are removed by the help of urinary system are coming in the form of **urine**.

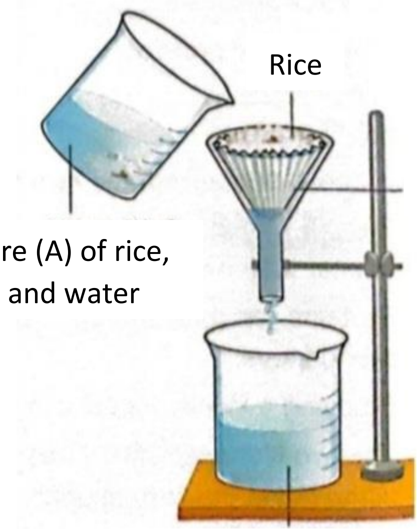
Give a reason for :

- Blood cells and proteins cannot pass through the kidney's nephrons.
  - **Because they are too large.**

What happens if...:

- The blood does not pass through the two kidneys during its circulation inside the human body.
  - **The blood will not be filtered from the waste materials and the body will get sick.**

Look at the opposite figure, then choose the correct answer from those between brackets:



- The filter in the opposite figure is like .... organ in the urinary system.
  (stomach – **kidney**)

- Mixture (A) is like .... which is found in the body.
  (**blood before filtering** - blood after filtering)

- Mixture (B) is like .... that comes out from the body.
  (filtered blood - **urine**)

- Rice in the opposite figure is like .... which cannot pass through nephrons during filtration of blood.
  (**proteins** – urea)

Lesson 6

Choose the correct answer:

1. Diabetes disease occurs due to a disturbance in one organ of ………………… system.
   a. respiratory b. nervous c. endocrine d. urinary
2. The organ which is responsible for secreting insulin hormone is the …………………
   a. gallbladder b. pancreas c. liver d. stomach
3. Insulin hormone is responsible for regulating the level of …………………….. in blood.
   a. proteins b. fats c. water d. sugar
4. Pancreas belongs to ……………. system and its secretions help in completing ……………………… process.
   a. endocrine – digestion c. circulatory - respiration
   b. digestive – urination d. endocrine - sensation
5. People who suffer from diabetes can use the insulin pump device that injects the body automatically with ……………
   a. sugar b. water c. insulin d. carbohydrate

Put (√) or (X):

1- Diabetes disease is one of the disorders of the respiratory system. (X)
2- Pancreas secretes hormone to regulate sugar level in the blood. (√)
3- If pancreas cannot do its function correctly, the sugar level in blood doesn't affect. (X)
4- The body uses sugar to get its needed energy. (√)

5- The insulin pump device helps diabetics control the water level in the blood with automatic injections of insulin. (X)

6- Researchers are working to develop an artificial pancreas instead of the insulin pump device. (√)

Write the scientific term of each of the following:

- The organ that is responsible for regulating the sugar level in blood. (**pancreas**)
- A hormone that controls the level of sugar in the human blood. (**insulin hormone**)
- The system which helps in regulating sugar level in the blood by secreting a specific hormone. (**endocrine system**)
- A device that is used by diabetics to help them control the blood sugar levels with automatic injections of insulin. (**insulin pump**)
- A disease that is resulting from the disorder of secreting insulin hormone by pancreas. (**diabetes**)

Complete the following sentences using the words below:

(**insulin pump – endocrine - pancreas – blood – diabetes - insulin - energy**)

1) People that have a problem in secreting insulin hormone will be infected by **diabetes** disease.
2) Pancreas is one of the organs of **endocrine** system that produces **insulin** hormone.
3) Insulin regulates the sugar level in the **blood**.
4) Diabetics can control the blood sugar levels by using **insulin pump** device automatic injects the body with insulin.

5) Researchers are working to develop an artificial **pancreas** to pump insulin internally inside the human body.
6) The human body uses sugar to get its needed **energy** for doing all vital activities.

Give a reason for :

- Diabetics must give themselves regular shots of insulin.
    - **To regulate the level of sugar in the blood.**

What happens if…:

- Pancreas doesn't make its function correctly.
    - **The person will be infected with diabetes disease.**

Unit 1 – concept 3 - questions

Lesson 1

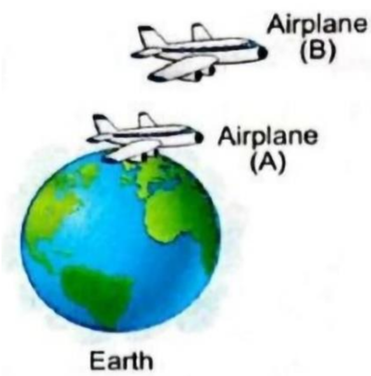
Choose the correct answer :

1. Gravity and magnetism are similar in that ....
   a. they are repulsion forces only.
   b. they are attraction forces only.
   c. they are forces that attract all objects.
   d. we cannot see them.

2. When we throw a ball upward it returns back to the Earth due to ....
   a. gravity only c. magnetism only
   b. electricity and mass d. magnetism and electricity

3. The .... of objects and the .... between them affect the gravity force.
   a. mass – color c. mass - distance
   b. distance – mass d. volume - distance

4. The force of Earth's gravity on plane (B) is .... that on plane (A).
   a. greater than c. equal to
   b. smaller than d. double



5. Magnets can be made of ....
   a. copper c. iron
   b. glass d. plastic

6. The area around the magnet in which its force appears is known as ....
   a. magnetic field c. electric current

b. magnetism d. gravity

Put (√) or (x):

1- The force of gravity increases between objects when the distance between them increases. ( )
2- Electric circuit is the path for electricity that consists of many components that work together as one system. ( )
3- Electricity and magnetism can work together. ( )
4- Earth attracts all objects on its surface due to its great mass. ( )
5- During the falling down of an object towards Earth's surface, the gravity force increases. ( )
6- Magnetism is an attraction or a repulsion force, while gravity is a repulsion force only. ( )
7- The force of gravity appears when any object is thrown upward into the air as it will return back to its surface. ( )
8- The magnet has a force called magnetism. ( )
9- Small pieces of paper can be used to see the magnetic field of a magnet. ( )
10- All materials can be attracted to the magnet. ( )

Write the scientific term of each of the following:

- The area around the magnet in which its magnetic force appears. (……………………………………)
- The force of Earth which attracts all objects on its surface to its center. (…………………………………..)

- The force that allows the magnet to attract some materials without making direct contact. (………………………………..)

Complete the following sentences:

1) The gravity of Earth is affected by two factors which are ………………………… and …………………….
2) By increasing the distance between objects, the …………………………. force between them ………………………….
3) To see the magnetic field of a magnet, we should use …………………… filings.
4) Magnetism is an attraction or ………….. force, while gravity is ……………………. force only.
5) All objects are pulled toward Earth's ………………………. due to ……………………. force of Earth.
6) Gravity attracts any object that has …………………….

Correct the underlined words:

A) Magnetism is a pulling or pushing force, while gravity is a **pushing** force only. (………………………….)

B) The magnet is surrounded by an area called **magnetism** in which the magnetic force of a magnet appears.

(………………………………)

C) **Gravity** is the force by which a magnet attracts some materials. (…………………….)

D) **Electricity** is the force that affects all objects that has mass and attracts them towards Earth's center.

(................................)

E) The force of gravity is affected by two factors which are distance and **color**. (........................)

Give reasons for:

- The electric circuit is considered as a system.

....

....

- When a ball is thrown into the air, it will stop moving upward and then falls down.

....

....

What happens to…:

- The force of gravity if the mass of an object increases.

....

....

- The force of gravity if the distance between the object and Earth's center increases.

....

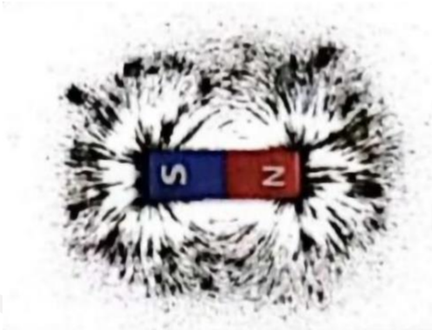
....

Complete the following sentences using the words below:

(**iron filings - magnet – magnetic field – iron**)

1. This tool is called ……………………….

   and it is made of ……………………………



2. This tool is surrounded by an area called

   ……………………………….

3. We can observe the force of this tool

   by using …………………… which make pattern around it.

Lesson 2

Choose the correct answer:

1. …………………….. is a magnetic material that is attracted to the magnet.
   a. Copper b. Iron c. Gold d. Wood

2. Some materials cannot be attracted to the magnet because they are ………………..
   a. magnetic materials
   b. made of nickel, iron and cobalt
   c. non-magnetic materials
   d. located at the magnetic field of the magnet.

3. When we put a piece of aluminum foil close to a magnet, it will ……………………
   a. be attracted to the magnet

b. be a magnet
c. not attract to the magnet
d. repel with the magnet

4. All the following materials are called magnetic materials, <u>except</u> …………………
   a. iron b. plastic c. nickel d. steel

5. Magnet affects certain objects like ………….. when they locate in its magnetic field.
   a. wood and steel c. iron and copper
   b. nickel and plastic d. cobalt and steel

6. The area around the magnet in which magnetism can be observed is known as ……………….
   a. magnetic materials c. non-magnetic materials
   b. magnetic field d. iron filings

<u>Put (√) or (x):</u>

1- Magnets attract the non-magnetic materials such as iron, nickel and steel. ( )
2- Cobalt is an example of magnetic materials. ( )
3- All magnets can be made of some materials like iron and glass. ( )
4- The magnetic objects are attracted to the magnet at any distance from the magnet. ( )
5- We can use the magnet to separate between some iron nails mixed with small pieces of copper. ( )
6- A piece of aluminum foil and a plastic spoon will be attracted to the magnet. ( )

Write the scientific term of each of the following:

- The materials that are attracted to the magnet.

(…………………………….)

- The materials that are not attracted to the magnet.

(…………………………………)

- The area around the magnet at which the magnetic materials are attracted to the magnet.

(……………………………………)

Complete the following sentences:

1) Magnets attract some metals, such as ……………………… , ……………………………. and ………………………
2) The magnetic materials will be attracted to the magnet when they are located at ……………… of the magnet.
3) If we put a wooden spoon near to a magnet it will not attract to it because it is made of ………………. material.
4) Materials are classified according to their ability to be attracted to the magnet into ………………………. materials and ………………….. materials.
5) Copper and ………………… will not attract to the magnet as they are …………………….. materials.

Give reasons for:

- Cobalt and nickel are considered as magnetic materials.

………………………………………………………………………………………………

………………………………………………………………………………………………

- Wood and copper are not attracted to the magnet.

………………………………………………………………………………………………

………………………………………………………………………………………………

What happens if …:

- ❖ A magnet is approached close to some iron nails mixed with small pieces of paper.

………………………………………………………………………………………………

………………………………………………………………………………………………

- ❖ The magnetic objects are placed at a distance and do not locate at the magnetic field of this magnet.

………………………………………………………………………………………………

………………………………………………………………………………………………

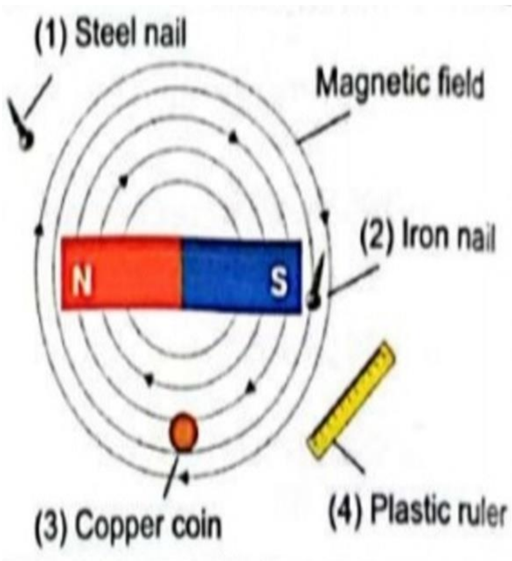
Classify the following materials into magnetic materials and non magnetic materials in the table below:

(**Iron nail - paper clip - plastic spoon – piece of glass - wooden clip – copper wire**)

Magnetic materials	Non-magnetic materials
……………………………………….	………………………………………..
……………………………………..	………………………………………..
……………………………………….	………………………………………..
……………………………………….	………………………………………..
……………………………………….	………………………………………..

__From the opposite figure, choose the correct answer:__

1. Material number (s) ………………….. will be attracted to the magnet.
   a. (1) only c. (2) only
   b. (1) and (2) only d. (3) and (4) only



2. Which of these materials are considered as magnetic materials?
   a. (1) and (2) c. (1), (2) and (3)
   b. (3) and (4) d. (1), (3) and (4)

3. Which of these materials are considered as non-magnetic materials?
   a. (1) and (2) c. (1), (2) and (3)
   b. (3) and (4) d. (1), (3) and (4)

Lesson 3

Choose the correct answer :

1. Mechanical energy is converted into energy in the generators.
   a. Light b. sound c. electric d. thermal

2. Generators are used in ……………….
   a. building houses and heating water.
   b. lighting houses and operating electric devices.
   c. producing sound energy.
   d. generating thermal energy.

3. The flow of electric charges along a closed path causes …………………..
   a. electric circuit c. electric current
   b. light energy d. sound energy.

4. ………………… are used to spin the magnet in the generator to produce electricity.
   a. Water and winds c. Electricity and sound
   b. Light and sound d. Sound and heat

5. Magnets are used in generators and …………… to generate ………………….
   a. turbines – sound c. lamps - heat
   b. switches – sound d. turbines - electricity

6. The source of electricity in any electric circuit may be ……………………
   a. a metal wire c. a battery
   b. A switch d. an electric lamp

7. The electric circuit contains ………. which is responsible for opening and closing the circuit.

a. a battery b. a switch c. a lamp d. a heater

8. When the switch is turned off, it ……………… the circuit, so the electric current …………………
   a. open - will flow through
   b. open - will not flow through
   c. close - will pass through
   d. close – will not pass through

9. All the following materials are considered as electric conductors, <u>except</u> …………….
   a. copper b. water c. rubber d. iron

10. The internal switch on a ………………… can be used in the refrigerator to adjust its temperature.
   a. battery b. thermostat c. light bulb d. wall socket

11. Electric insulators like ……………… and ……………. do not allow electricity flow through them.
   a. copper and plastic
   b. rubber and iron
   c. rubber and plastic
   d. copper and iron

12. When electric current flows through your body it ……….
   a. causes an electric shock.
   b. increasing your mass.
   c. decreasing the water level in your body.
   d. does not affect your body.

13. A magnetic field can be formed when electric current flows around ……….
   a. a plastic tube
   c. a metal core

b. a battery d. a glass core

Choose from column (B) what suits it in column (A):

(A)	(B)
1. Electricity	a. is a closed path through which electrons move.
2. Electric conductors	b. are materials that electric charges flow through.
3. Electric circuit	c. is a source of electric charges in the circuit.
4. Electric insulators	d. is a form of energy.
5. Battery	e. is used to open and close the circuit.
	f. are materials through which electrons can't flow.

Put (√) or (x):

1- Electricity can be produced from magnetism. ( )
2- Water in dams are used to operate wind turbines. ( )
3- To make electric current flow through a circuit, all components must be connected to each other. ( )
4- The electric circuit must contain a source of electricity such as the switch. ( )
5- The thermostat in a refrigerator contains an automatic switch. ( )
6- All materials allow electric current to flow through them. ( )
7- Copper, aluminum and rubber are electric conductors.

( )

8- When the electric circuit is opened, the electric current doesn't flow through it. ( )

9- All metals are electric insulators. ( )

10- Electric wire can be made of copper and covered with plastic or rubber. ( )

<u>Write the scientific term of each of the following:</u>

- The device which changes mechanical energy into electrical energy. (………………………………)
- A form of energy produced from generators and turbines. (…………………………………)
- The flow of electrons through an electric wire. (…………………………………)
- A closed loop through which electric current can flow. (…………………………………)
- A tool in the circuit which is used to open and close the circuit. (…………………………………)
- It is used to adjust the temperature inside some devices such as the refrigerator. (………………………………)
- The materials that the electric charges can flow through. (…………………………………)
- They are materials that do not allow electric current to flow through. (…………………………………)

Complete the following sentences:

1) The generator consists of large …………. and ……………………
2) Mechanical energy can be changed into …………………….. energy in the generator.
3) The electric current can transmit in a path called ……………………………….
4) The source of electricity in the electric circuit could be …………………… or …………………… that transfers current from power lines connected to the building.
5) From the components of the electric circuit ……………………, an electric power source, …………… and an electric device.
6) The tool that opens and close the circuit is called ……………………..
7) When the switch is ………………… , the circuit will be …………………… so the electric current flows.
8) There are materials known as ………………… that allow electrons to flow through such as …………………….. and ………………………
9) The electric current causes ……………………. in the human body as it contains ……………… that is good conductor of electricity.
10) Wood, ………………… and ………………….. are examples of electric insulators.

Give reasons for:

- Electric generators have great importance in our life.

…………………………………………………………………………………………………

…………………………………………………………………………………………………

- The electric circuit must contain a battery.

…………………………………………………………………………………………………

…………………………………………………………………………………………………

- All metals are considered as electric conductors.

…………………………………………………………………………………………………

…………………………………………………………………………………………………

- Most electric wires are covered with rubber or plastic.

…………………………………………………………………………………………………

…………………………………………………………………………………………………

What happens if…:

❖ Large magnets spin at a high speed, around coiled wires.

…………………………………………………………………………………………………

…………………………………………………………………………………………………

❖ The electric circuit doesn't contain switch.

…………………………………………………………………………………………………

…………………………………………………………………………………………………

❖ The switch is closed in the electric circuit.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

Look at the opposite figure then answer:



a. This device is called …………………..

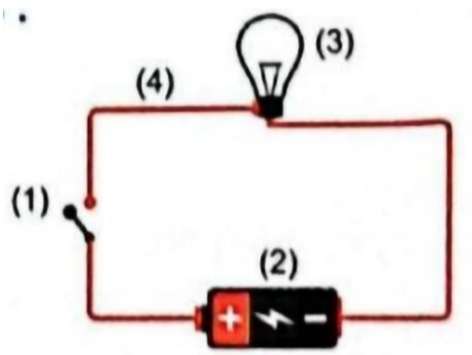
b. It consists of ………………… and …………………

c. The idea of its work is changing …………………… energy into …………………………… energy.

d. This device is used ………………….. and ……………………

Look at the opposite figure, then answer the questions:

A) Label the figure:



1. ……………………………

2. …………………………….

3. …………………………….

4. ……………………………..

B) What is the function of device number?

1- ………………………..

2- ………………………..

C) What happens if device number (1) is closed?

……………………………………………………………………………………………………

Lesson 4

Choose the correct answer:

1. …………………. is a material that cannot allow electric current to flow through.
   a. Iron b. Copper c. Plastic d. Cobalt

2. The electric wires can be made of ……………. or ……………...
   a. wood – plastic c. aluminum - copper
   b. rubber- wood d. plastic - rubber

3. The electric wires are covered with ………………… as it is …………………
   a. copper- good conductor of electricity
   b. plastic - bad conductor of electricity
   c. Iron - strong material
   d. Plastic - electric conductor

4. All the following materials are electric insulators, <u>except</u> ……………….
   a. rubber b. plastic c. wood d. steel

5. Which of the following is a poor conductor of electricity and is used to coat wires?...........
   a. A conductor c. A switch
   b. Non insulator d. A battery

6. Metallic materials are considered electric .... , while glass and rubber are considered electric ....
   a. insulators – conductors
   b. conductors – insulators
   c. circuits - conductors
   d. insulators - energy

Put (√) or (x):

1- Wood and plastic are electric insulators. (   )
2- Electric current can flow through all materials. (   )
3- Electric wires are covered with plastic to protect us from electric shock. (   )
4- Electric insulators only allow electric current to pass through them. (   )
5- Copper, rubber and iron are electric conductors. (   )
6- Materials made of metals can conduct electricity. (   )
7- If your hand touches an insulated wire you will be shocked by electricity. (   )
8- Glass is a good conductor of electricity, while water is a bad conductor of electricity. (   )

Complete the following sentences:

1) All metals like .... and .... are called electric ………………………..
2) Some materials called ………………… because they don’t allow electric current to flow through them like …………………….. and …………………..
3) Electric wires are made of copper which is an electric ……………………… but they are wrapped in ……………… which is an electric insulator.

4) Electric wires are coated with ………………… or …………….. to protect us from ………………

5) Handles of screwdrivers are made of plastic as it is an electric …………………………..

Give reasons for:

- Electric wires are made of copper.

…………………………………………………………………………………………………

…………………………………………………………………………………………………

- Electric wires are wrapped in plastic.

…………………………………………………………………………………………………

…………………………………………………………………………………………………

What happens if…:

- Rubber is used in making electric wires instead of copper.

…………………………………………………………………………………………………

…………………………………………………………………………………………………

- A person touches non insulated electric wire through which an electric current pass.

…………………………………………………………………………………………………

…………………………………………………………………………………………………

Look at the opposite figure, then answer:

Classify the following materials into materials that will close the circuit and others will not close it? Giving reason?

(Iron nail - plastic spoon – Rubber – Metallic spoon – Piece of wood – Metallic key)



- The materials which will close the circuit:

………………………………………………………………………

The reason:

………………………………………………………………………

………………………………………………………………………

- The materials which will not close the circuit:

………………………………………………………………………………………

The reason:

………………………………………………………………………………………

Lesson 5

Choose the correct answer:

1. Electricity can flow through …………………..
   a. electric conductors c. wooden bar
   b. electric insulators d. an eraser

2. ……………… are used to stop the flow of electricity.
   a. Resistors c. Electric insulators
   b. Electric conductors d. Galvanometers

3. ……………. can be found in toasters and …………………
   a. Microwaves - electric stoves
   b. Resistors - electric stoves
   c. Electric stove - resistors
   d. Microwaves – electric resistors

4. In the ……….. circuit, all components are connected in one loop.
   a. open parallel c. open series
   b. closed parallel d. closed series

5. In a …………, the electric current can flow through different branches.
   a. series circuit c. resistor
   b. parallel circuit d. microwave

6. ……………… is used to slow the flow of an electric current in the electric circuit.
   a. A battery b. A switch c. A resistor d. A lamp

7. Scientists use a ………………. to detect the flow of small electric currents.
   a. generator c. battery
   b. galvanometer d. switch

8. Resistors are found in all of the following devices, <u>except</u> ………….
   a. toasters c. electric stoves
   b. microwaves d. batteries

9. All of the following are from the properties of parallel electric circuits, <u>except</u> ……………….

a. all components are connected together
b. electric current pass in one loop only
c. we can turn off or remove one light bulb without affecting the other light bulbs.
d. electric current flow through different branches.

10. The electric wires are made of …………… that conduct electricity.

a. plastic and glass
b. rubber and aluminum
c. copper and aluminum
d. wood and plastic

<u>Put (√) or (x):</u>

1- In the series circuits, the electric current can flow in different branches. ( )
2- The materials that are used to connect the components of the electric circuit are called electric insulators. ( )
3- Resistors are used to slow the flow of electrons through an electric circuit. ( )
4- The electric insulators keep us safe from getting shocked by the electric current. ( )
5- Towns and cities are parts of an electric circuit. ( )
6- The electric devices in houses are connected in series circuits. ( )
7- The device that is used to detect the small electric current intensity is called galvanometer. ( )
8- When a magnet is placed at rest away from copper coil, an electric current will be produced. ( )
9- The needle of a galvanometer moves on moving a magnet in and out of a copper coil. ( )

10- By increasing the number of loops in any coil and moving a magnet inside it rapidly, the amount of generated electric current will decrease. ( )

11- There is no relation between magnetism and electricity. ( )

Write the scientific term of each of the following:

- One of the components of an electric circuit that is used to limit the flow of electricity through the circuit.

  (……………………………….)

- The type of electric circuits in which all components must be connected in one loop. (……………………………….)
- The type of electric circuits that are found in houses and help in operating man devices at the same time.

  (………………………………….)

- A device can be used to detect the flow of small electric currents. (………………………………….)
- Materials that allow electrons to flow through them easily.

  (…………………………….)

- Materials that don't allow electrons to flow through them easily. (……………………………….)

Complete the following sentences:

1) Rubber is an electric ………………., while copper is an electric ………………………

2) Electric wires are coated by ……………………. as it is an electric insulator.
3) Many devices as ……………… , microwaves and electric stoves contain ………………. which are used to slow the electric current.
4) In the ……………. circuit there is only one path that the electric current can flow through.
5) A moving magnet inside a coiled wire can generate ………………….
6) By increasing the number of loops in the coil, and moving a magnet inside it, the amount of generated electric current will …………………….
7) The electric current can flow through different branches in ………………… circuits.
8) Electric circuits in houses are connected in …………………… way.
9) The relation between magnetism and electricity is used in electric ……………… , electric generators and electric …………………….

Give reasons for:

- Some electric circuits contain resistors.

………………………………………………………………………………………………

………………………………………………………………………………………………

- In the parallel circuit, we can turn off or remove one light bulb while the other light bulb will remain lit.

………………………………………………………………………………………………

………………………………………………………………………………………………

- When a magnet is moved rapidly back and forth inside a coil, the needle of the galvanometer connected to the coil moves rapidly.

………………………………………………………………………………………………

………………………………………………………………………………………………

<u>What happens if…:</u>

❖ A large amount of electricity passes through an electric circuit has an electric device, and this circuit does not contain a resistor.

………………………………………………………………………………………………

………………………………………………………………………………………………

❖ Electric circuits in houses are connected in series.

………………………………………………………………………………………………

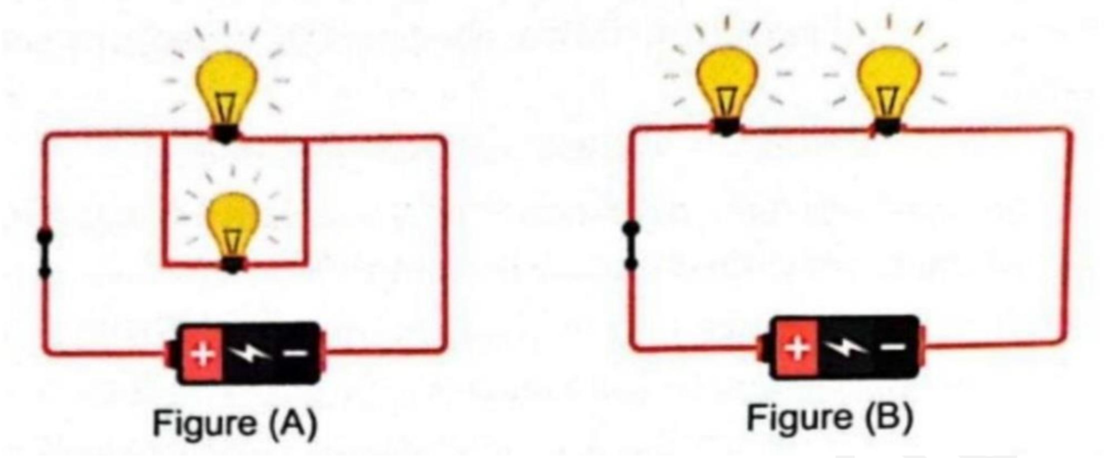
………………………………………………………………………………………………

❖ A magnet is moved rapidly inside a coil of wire in a circuit containing galvanometer.

………………………………………………………………………………………………

………………………………………………………………………………………………

Look at the following figures then answer:



A) Choose :

1. Which of these figures is a series circuit ?

   (Figure A - Figure B)

2. Which of these figures is parallel circuit ?

   (Figure A - Figure B)

B) Put (√) or (x):

1. If we remove a lamp from the circuit in figure (A), the other lamp will still lit. (   )
2. If the switch in figure (B) is replaced by a metallic paper clip, all lamps will turn off. (   )

Lesson 6

Choose the correct answer:

1. The ……………… is a muscle that beats inside the human body to push the blood to all body parts.
   a. stomach b. brain c. heart d. hair

2. The normal heart has a ……….. which creates electrical current that cause the heart to ………
    a. natural pacemaker – stop
    b. natural pacemaker – contract
    c. artificial pacemaker - stop
    d. artificial pacemaker – contract

3. The artificial pacemaker is inserted into the ………. of the human body.
    a. brain   b. chest   c. legs   d. hands

4. The artificial pacemaker contains a ……….. to send information to physicians, so they know the condition of the ……………………
    a. battery – lung   c. built-in antenna - heart
    b. motherboard – brain   d. battery - heart

Put (√) or (x):

1- Sometimes electricity can be used to help our body parts to move. (   )
2- The heart is important in our body as it helps in food digestion. (   )
3- The natural pacemaker inside our heart creates electrical currents to make it contracts. (   )
4- Scientists use an artificial pacemaker to stimulate the heart muscle to beat regularly. (   )
5- The artificial pacemaker should contain a battery to do its function. (   )

Write the scientific term of each of the following:

- A muscle in the human body that beat regularly to push the blood inside the body. (………………………………)
- A device inserted into the chest to stimulate the heart to beat regularly. (…………………………)

Complete the following sentences:

1) The heart has a natural ……………. which causing the heart to contract.
2) The artificial pacemaker has a built-in ……………. to send information to physicians.
3) To build a pacemaker, ………………… , an insulated electric wire with a coating and ………………… are needed.

Give reasons for:

- Scientists provide the new artificial pacemaker by a built-in antenna.

……………………………………………………………………………………………

……………………………………………………………………………………………

- The heart has a natural pacemaker.

……………………………………………………………………………………………

……………………………………………………………………………………………

What happens if …:

❖ A patient has a slow or irregular heartbeats.

………………………………………………………………………………………………………

………………………………………………………………………………………………………

Unit 1 – concept 3 - answers

Lesson 1

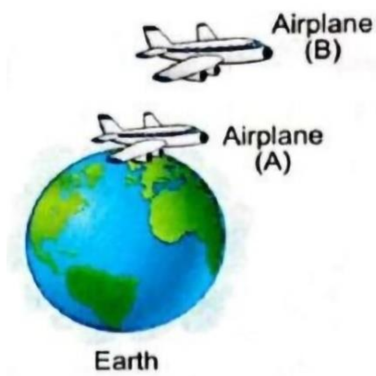
Choose the correct answer :

1. Gravity and magnetism are similar in that ....
   a. they are repulsion forces only.
   b. they are attraction forces only.
   c. they are forces that attract all objects.
   d. we cannot see them.

2. When we throw a ball upward it returns back to the Earth due to ....
   a. gravity only
   c. magnetism only
   b. electricity and mass
   d. magnetism and electricity

3. The .... of objects and the .... between them affect the gravity force.
   a. mass – color
   c. mass - distance
   b. distance – mass
   d. volume - distance

4. The force of Earth's gravity on plane (B) is .... that on plane (A).
   a. greater than
   c. equal to
   b. smaller than
   d. double



5. Magnets can be made of ....
   a. copper
   c. iron
   b. glass
   d. plastic

6. The area around the magnet in which its force appears is known as ....
   a. magnetic field
   c. electric current

b. magnetism d. gravity

Put (√) or (x):

1- The force of gravity increases between objects when the distance between them increases. (**X**)
2- Electric circuit is the path for electricity that consists of many components that work together as one system. (**√**)
3- Electricity and magnetism can work together. (**√**)
4- Earth attracts all objects on its surface due to its great mass. (**√**)
5- During the falling down of an object towards Earth's surface, the gravity force increases. (**√**)
6- Magnetism is an attraction or a repulsion force, while gravity is a repulsion force only. (**X**)
7- The force of gravity appears when any object is thrown upward into the air as it will return back to its surface. (**√**)
8- The magnet has a force called magnetism. (**√**)
9- Small pieces of paper can be used to see the magnetic field of a magnet. (**X**)
10- All materials can be attracted to the magnet. (**X**)

Write the scientific term of each of the following:

- The area around the magnet in which its magnetic force appears. (**magnetic field**)
- The force of Earth which attracts all objects on its surface to its center. (**gravity**)
- The force that allows the magnet to attract some materials without making direct contact. (**magnetism**)

Complete the following sentences:

1) The gravity of Earth is affected by two factors which are **distance** and **mass**.
2) By increasing the distance between objects, the **gravitational** force between them **decreases**.
3) To see the magnetic field of a magnet, we should use **iron** filings.
4) Magnetism is an attraction or **repulsion** force, while gravity is **attraction** force only.
5) All objects are pulled toward Earth's **surface** due to **gravity** force of Earth.
6) Gravity attracts any object that has **mass**.

Correct the underlined words:

A) Magnetism is a pulling or pushing force, while gravity is a **pushing** force only. (**pulling**)
B) The magnet is surrounded by an area called **magnetism** in which the magnetic force of a magnet appears. (**magnetic field**)
C) **Gravity** is the force by which a magnet attracts some materials. (**magnetism**)
D) **Electricity** is the force that affects all objects that has mass and attracts them towards Earth's center. (**gravity**)
E) The force of gravity is affected by two factors which are distance and **color**. (**mass**)

Give reasons for:

- The electric circuit is considered as a system.
  - **Because the electric circuit is a path for electricity that consists of many components that work together as one system.**

- When a ball is thrown into the air, it will stop moving upward and then falls down.
  - **Due to the gravity force of Earth.**

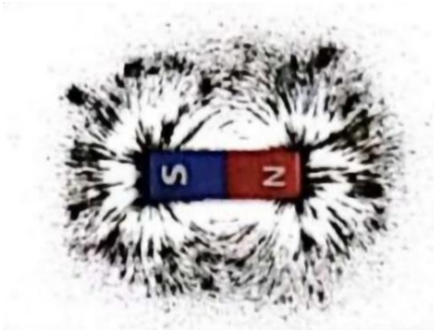
What happens to…:

- The force of gravity if the mass of an object increases.
  - **The force of gravity will increase.**

- The force of gravity if the distance between the object and Earth's center increases.
  - **The force of gravity between them will decrease.**

Complete the following sentences using the words below:

(iron filings - magnet – magnetic field – iron)



1. This tool is called **magnet** and it is made of **iron**.
2. This tool is surrounded by an area called **magnetic field**.
3. We can observe the force of this tool by using **iron filings** which make pattern around it.

Lesson 2

Choose the correct answer:

1. …………………… is a magnetic material that is attracted to the magnet.
   a. Copper **b. Iron** c. Gold d. Wood

2. Some materials cannot be attracted to the magnet because they are ………………..
   a. magnetic materials
   b. made of nickel, iron and cobalt
   c. non-magnetic materials
   d. located at the magnetic field of the magnet.

3. When we put a piece of aluminum foil close to a magnet, it will ……………………
   a. be attracted to the magnet
   b. be a magnet
   c. not attract to the magnet
   d. repel with the magnet

4. All the following materials are called magnetic materials, except ………………..
   a. iron b. plastic c. nickel d. steel

5. Magnet affects certain objects like …………. when they locate in its magnetic field.
   a. wood and steel c. iron and copper
   b. nickel and plastic d. cobalt and steel

6. The area around the magnet in which magnetism can be observed is known as ……………..
   a. magnetic materials c. non-magnetic materials
   b. magnetic field d. iron filings

Put (√) or (x):

1- Magnets attract the non-magnetic materials such as iron, nickel and steel. (X)
2- Cobalt is an example of magnetic materials. (√)

3- All magnets can be made of some materials like iron and glass. (**X**)
4- The magnetic objects are attracted to the magnet at any distance from the magnet. (**X**)
5- We can use the magnet to separate between some iron nails mixed with small pieces of copper. (**√**)
6- A piece of aluminum foil and a plastic spoon will be attracted to the magnet. (**X**)

Write the scientific term of each of the following:

- The materials that are attracted to the magnet.
  (**magnetic materials**)
- The materials that are not attracted to the magnet.
  (**non-magnetic materials**)
- The area around the magnet at which the magnetic materials are attracted to the magnet.
  (**magnetic field**)

Complete the following sentences:

1) Magnets attract some metals, such as **iron**, **nickel** and **cobalt**.
2) The magnetic materials will be attracted to the magnet when they are located at **the magnetic field** of the magnet.
3) If we put a wooden spoon near to a magnet it will not attract to it because it is made of **non-magnetic** material.
4) Materials are classified according to their ability to be attracted to the magnet into **magnetic** materials and **non-magnetic** materials.
5) Copper and **plastic** will not attract to the magnet as they are **non-magnetic** materials.

Give reasons for:

- Cobalt and nickel are considered as magnetic materials.
  - **Because they are attracted to the magnet.**

- Wood and copper are not attracted to the magnet.
  - **Because they are non-magnetic materials.**

What happens if …:

- A magnet is approached close to some iron nails mixed with small pieces of paper.
  - **The magnet will attract the iron nails but it will not attract the small pieces of paper.**

- The magnetic objects are placed at a distance and do not locate at the magnetic field of this magnet.
  - **They will not be attracted to the magnet.**

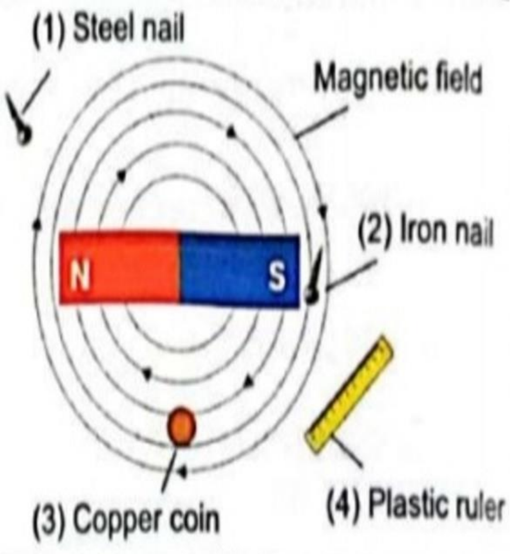
Classify the following materials into magnetic materials and non magnetic materials in the table below:

(**Iron nail - paper clip - plastic spoon – piece of glass - wooden clip – copper wire**)

Magnetic materials	Non-magnetic materials
▪ Iron nail ▪ Paper clip	▪ Plastic spoon ▪ Piece of glass ▪ Wooden clip ▪ Copper wire

From the opposite figure, choose the correct answer:

1. Material number (s) …………………. will be attracted to the magnet.
   a. (1) only
   b. (1) and (2) only
   c. (2) only
   d. (3) and (4) only



2. Which of these materials are considered as magnetic materials?
   a. (1) and (2)
   b. (3) and (4)
   c. (1), (2) and (3)
   d. (1), (3) and (4)

3. Which of these materials are considered as non-magnetic materials?
   a. (1) and (2)
   b. (3) and (4)
   c. (1), (2) and (3)
   d. (1), (3) and (4)

Lesson 3

Choose the correct answer:

1. Mechanical energy is converted into energy in the generators.
   a. Light b. sound c. electric d. thermal

2. Generators are used in ………………
   a. building houses and heating water.
   b. lighting houses and operating electric devices.
   c. producing sound energy.
   d. generating thermal energy.

3. The flow of electric charges along a closed path causes ....
   a. electric circuit
   c. electric current
   b. light energy
   d. sound energy.

4. .... are used to spin the magnet in the generator to produce electricity.
   a. Water and winds
   c. Electricity and sound
   b. Light and sound
   d. Sound and heat

5. Magnets are used in generators and .... to generate ....
   a. turbines – sound
   c. lamps - heat
   b. switches – sound
   d. turbines - electricity

6. The source of electricity in any electric circuit may be ....
   a. a metal wire
   c. a battery
   b. A switch
   d. an electric lamp

7. The electric circuit contains .... which is responsible for opening and closing the circuit.

a. a battery   b. a switch   c. a lamp   d. a heater

8. When the switch is turned off, it .... the circuit, so the electric current ....
   a. open - will flow through
   b. open - will not flow through
   c. close - will pass through
   d. close – will not pass through

9. All the following materials are considered as electric conductors, <u>except</u> ....

a. copper   b. water   c. rubber   d. iron

10. The internal switch on a ………………… can be used in the refrigerator to adjust its temperature.
    a. battery   b. thermostat   c. light bulb   d. wall socket

11. Electric insulators like ………………. and ……………. do not allow electricity flow through them.
    a. copper and plastic
    b. rubber and iron
    c. rubber and plastic
    d. copper and iron

12. When electric current flows through your body it ……….
    a. causes an electric shock.
    b. increasing your mass.
    c. decreasing the water level in your body.
    d. does not affect your body.

13. A magnetic field can be formed when electric current flows around ……….
    a. a plastic tube
    b. a battery
    c. a metal core
    d. a glass core

Choose from column (B) what suits it in column (A):

(A)	(B)
1. Electricity **d**	a. is a closed path through which electrons move.
2. Electric conductors **b**	b. are materials that electric charges flow through.
3. Electric circuit **a**	c. is a source of electric charges in the circuit.

4. Electric insulators **f**	d. is a form of energy.
5. Battery **c**	e. is used to open and close the circuit.
	f. are materials through which electrons can't flow.

Put (√) or (x):

1- Electricity can be produced from magnetism. (**√**)
2- Water in dams are used to operate wind turbines. (**X**)
3- To make electric current flow through a circuit, all components must be connected to each other. (**√**)
4- The electric circuit must contain a source of electricity such as the switch. (**X**)
5- The thermostat in a refrigerator contains an automatic switch. (**√**)
6- All materials allow electric current to flow through them. (**X**)
7- Copper, aluminum and rubber are electric conductors. (**X**)
8- When the electric circuit is opened, the electric current doesn't flow through it. (**√**)
9- All metals are electric insulators. (**X**)
10- Electric wire can be made of copper and covered with plastic or rubber. (**√**)

Write the scientific term of each of the following:

- The device which changes mechanical energy into electrical energy. (**generator**)
- A form of energy produced from generators and turbines. (**electricity**)
- The flow of electrons through an electric wire. (**electric current**)
- A closed loop through which electric current can flow.

(**electric circuit**)

- A tool in the circuit which is used to open and close the circuit. (**switch**)
- It is used to adjust the temperature inside some devices such as the refrigerator. (**thermostat**)
- The materials that the electric charges can flow through. (**electric conductors**)
- They are materials that do not allow electric current to flow through. (**electric insulators**)

Complete the following sentences:

1) The generator consists of large **magnets** and **coiled wires**.
2) Mechanical energy can be changed into **electrical** energy in the generator.
3) The electric current can transmit in a path called **electric circuit**.
4) The source of electricity in the electric circuit could be **a battery** or **a wall socket** that transfers current from power lines connected to the building.
5) From the components of the electric circuit **metal wire** an electric power source, **switch** and an electric device.
6) The tool that opens and close the circuit is called **switch**.
7) When the switch is **closed**, the circuit will be **turned on** so the electric current flows.
8) There are materials known as **electric conductors** that allow electrons to flow through such as **copper** and **iron**.
9) The electric current causes **electric shock** in the human body as it contains **water** that is good conductor of electricity.
10) Wood, **glass** and plastic are examples of electric insulators.

Give reasons for:

- Electric generators have great importance in our life.
  - **Because they are used in lighting houses and operating electrical devices.**
- The electric circuit must contain a battery.
  - **Because the battery is the source of electricity in the electric circuit.**
- All metals are considered as electric conductors.
  - **Because they allow electric current to flow through them easily.**
- Most electric wires are covered with rubber or plastic.
  - **Because rubber and plastic are bad conductors of electricity to protect people from electric shock.**

What happens if…:

- Large magnets spin at a high speed, around coiled wires.
  - **The spinning magnets create electrical charges on the coiled wires, so electricity is produced.**
- The electric circuit doesn't contain switch.
  - **We can't open or close the circuit.**
- The switch is closed in the electric circuit.
  - **The electric circuit will be closed, so the electric current flows through the circuit.**

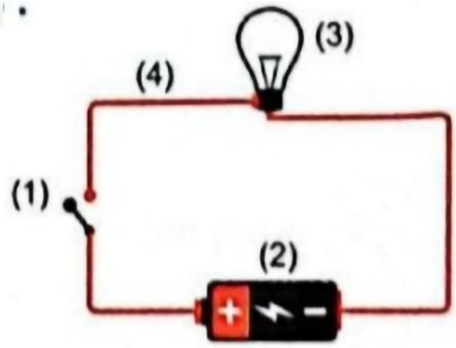
Look at the opposite figure then answer:



a. This device is called **electric generator**.
b. It consists of **large magnets** and **coiled wires**.
c. The idea of its work is changing **mechanical** energy into **electrical** energy.
d. This device is used **lighting houses** and **operating electrical devices**.

Look at the opposite figure, then answer the questions:

A) Label the figure:



1. **Switch**
2. **Battery**
3. **Lamp**
4. **Metal wire**

B) What is the function of device number?

1- It's used to open and close the circuit.
2- It's the source of electricity in the circuit.

C) What happens if device number (1) is closed?

- **The electric circuit will be closed, so the electric current flows through the circuit.**

Lesson 4

Choose the correct answer:

1. .... is a material that cannot allow electric current to flow through.
   a. Iron   b. Copper   c. Plastic   d. Cobalt

2. The electric wires can be made of .... or ....
   a. wood – plastic
   b. rubber- wood
   c. aluminum - copper
   d. plastic - rubber

3. The electric wires are covered with .... as it is ....
   a. copper- good conductor of electricity
   b. plastic - bad conductor of electricity
   c. Iron - strong material
   d. Plastic - electric conductor

4. All the following materials are electric insulators, <u>except</u> ....
   a. rubber
   b. plastic
   c. wood
   d. steel

5. Which of the following is a poor conductor of electricity and is used to coat wires?...........
   a. A conductor
   b. Non insulator
   c. A switch
   d. A battery

6. Metallic materials are considered electric .... , while glass and rubber are considered electric ....
   a. insulators – conductors
   b. conductors – insulators
   c. circuits - conductors
   d. insulators - energy

<u>Put (√) or (x):</u>

1- Wood and plastic are electric insulators. (√)
2- Electric current can flow through all materials. (X)
3- Electric wires are covered with plastic to protect us from electric shock. (√)
4- Electric insulators only allow electric current to pass through them. (X)
5- Copper, rubber and iron are electric conductors. (X)

6- Materials made of metals can conduct electricity. (**√**)

7- If your hand touches an insulated wire you will be shocked by electricity. (**X**)

8- Glass is a good conductor of electricity, while water is a bad conductor of electricity. (**X**)

Complete the following sentences:

1) All metals like **copper** and **aluminum** are called electric **conductors**.
2) Some materials called **electric insulators** because they don't allow electric current to flow through them like **plastic** and **rubber**.
3) Electric wires are made of copper which is an electric **conductor** but they are wrapped in **plastic** which is an electric insulator.
4) Electric wires are coated with **plastic** or **rubber** to protect us from **electric shock**.
5) Handles of screwdrivers are made of plastic as it is an electric **insulator**.

Give reasons for:

- Electric wires are made of copper.
  - **Because copper is an electric conductor that allow electric current to flow through.**

- Electric wires are wrapped in plastic.
  - **Because plastic is an electric insulator to prevent electricity from moving from the metal wire into our hands.**

What happens if…:

- Rubber is used in making electric wires instead of copper.
  - **The electric current will not flow through the wire.**

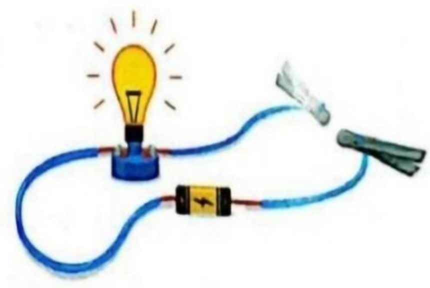
❖ A person touches non insulated electric wire through which an electric current pass.

- **The electric current will flow through his body and will be shocked by electricity.**

Look at the opposite figure, then answer:

Classify the following materials into materials that will close the circuit and others will not close it? Giving reason?

(**Iron nail - plastic spoon – Rubber – Metallic spoon – Piece of wood – Metallic key**)



- The materials which will close the circuit:
  Iron nail – metallic spoon – metallic key

The reason:

Because they are electric conductors.

- The materials which will not close the circuit:
  Plastic spoon – rubber – piece of wood

The reason:

Because they are electric insulators.

Lesson 5

Choose the correct answer:

1. Electricity can flow through ....
   a. electric conductors
   b. electric insulators
   c. wooden bar
   d. an eraser

2. .... are used to stop the flow of electricity.
   a. Resistors
   b. Electric conductors
   c. Electric insulators
   d. Galvanometers

3. ……………. can be found in toasters and ………………….
    a. Microwaves - electric stoves
    b. Resistors - electric stoves
    c. Electric stove - resistors
    d. Microwaves – electric resistors

4. In the ……….. circuit, all components are connected in one loop.
    a. open parallel
    b. closed parallel
    c. open series
    d. closed series

5. In a …………, the electric current can flow through different branches.
    a. series circuit
    b. parallel circuit
    c. resistor
    d. microwave

6. ……………… is used to slow the flow of an electric current in the electric circuit.
    a. A battery
    b. A switch
    c. A resistor
    d. A lamp

7. Scientists use a ………………. to detect the flow of small electric currents.
    a. generator
    b. galvanometer
    c. battery
    d. switch

8. Resistors are found in all of the following devices, <u>except</u> …………..
    a. toasters
    b. microwaves
    c. electric stoves
    d. batteries

9. All of the following are from the properties of parallel electric circuits, <u>except</u> ………………

a. all components are connected together
b. electric current pass in one loop only
c. we can turn off or remove one light bulb without affecting the other light bulbs.
d. electric current flow through different branches.

10. The electric wires are made of …………… that conduct electricity.

a. plastic and glass
b. rubber and aluminum
c. copper and aluminum
d. wood and plastic

Put (√) or (x):

1- In the series circuits, the electric current can flow in different branches. (X)
2- The materials that are used to connect the components of the electric circuit are called electric insulators. (X)
3- Resistors are used to slow the flow of electrons through an electric circuit. (√)
4- The electric insulators keep us safe from getting shocked by the electric current. (√)
5- Towns and cities are parts of an electric circuit. (√)
6- The electric devices in houses are connected in series circuits. (X)
7- The device that is used to detect the small electric current intensity is called galvanometer. (√)
8- When a magnet is placed at rest away from copper coil, an electric current will be produced. (X)
9- The needle of a galvanometer moves on moving a magnet in and out of a copper coil. (√)
10- By increasing the number of loops in any coil and moving a magnet inside it rapidly, the amount of generated electric current will decrease. (X)
11- There is no relation between magnetism and electricity. (X)

Write the scientific term of each of the following:

- One of the components of an electric circuit that is used to limit the flow of electricity through the circuit.
  (**resistor**)
- The type of electric circuits in which all components must be connected in one loop. (**series circuits**)
- The type of electric circuits that are found in houses and help in operating man devices at the same time.
  (**parallel circuits**)
- A device can be used to detect the flow of small electric currents. (**galvanometer**)
- Materials that allow electrons to flow through them easily.
  (**electric conductors**)
- Materials that don't allow electrons to flow through them easily. (**electric insulators**)

Complete the following sentences:

1) Rubber is an electric **insulator**, while copper is an electric **conductor**.
2) Electric wires are coated by **plastic** as it is an electric insulator.
3) Many devices as **toasters** , microwaves and electric stoves contain **resistors** which are used to slow the electric current.
4) In the **series** circuit there is only one path that the electric current can flow through.
5) A moving magnet inside a coiled wire can generate **electric current**.
6) By increasing the number of loops in the coil, and moving a magnet inside it, the amount of generated electric current will **increase**.
7) The electric current can flow through different branches in **parallel** circuits.
8) Electric circuits in houses are connected in **parallel** way.

9) The relation between magnetism and electricity is used in electric **motors**, electric generators and electric **transformers**.

Give reasons for:

- Some electric circuits contain resistors.
    - **Because resistors are used to slow the flow of electrons through an electric circuit to avoid the damage of its components.**

- In the parallel circuit, we can turn off or remove one light bulb while the other light bulb will remain lit.
    - **Because in the parallel circuit, the electric current can flow along different branches.**

- When a magnet is moved rapidly back and forth inside a coil, the needle of the galvanometer connected to the coil moves rapidly.
    - **Because when the magnet moves inside the coil of wire, an electric current flow.**

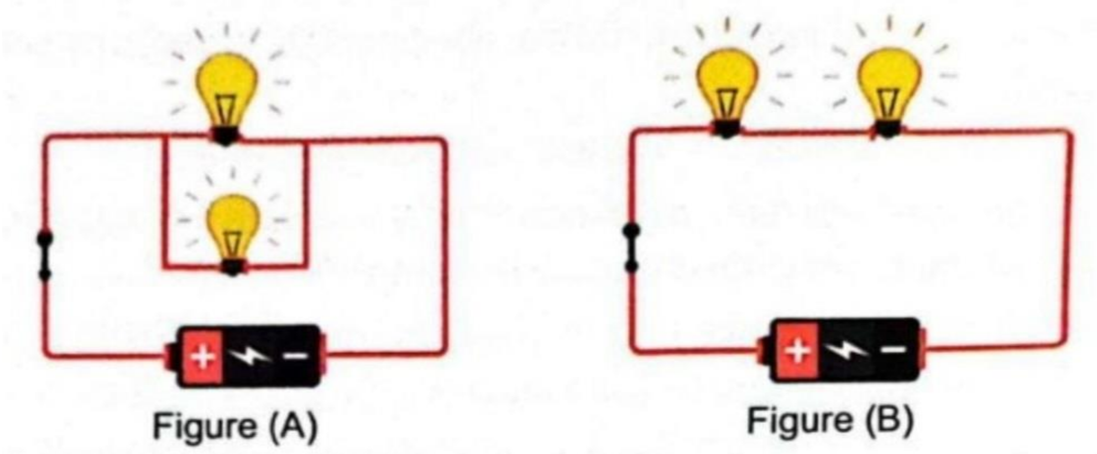
What happens if…:

- A large amount of electricity passes through an electric circuit has an electric device, and this circuit does not contain a resistor.
    - **The components of the electric circuit will be damaged.**

- Electric circuits in houses are connected in series.
    - **If one light bulb blows out or is disconnected, the other one will not work.**

- ❖ A magnet is moved rapidly inside a coil of wire in a circuit containing galvanometer.
  - **The needle of the galvanometer will move rapidly, and the generated electric current will increase.**

Look at the following figures then answer:



A) Choose :

1. Which of these figures is a series circuit ?
   (Figure A - **Figure B**)

2. Which of these figures is a parallel circuit ?
   (**Figure A** - Figure B)

B) Put (√) or (x):

1. If we remove a lamp from the circuit in figure (A), the other lamp will still lit. (**√**)
2. If the switch in figure (B) is replaced by a metallic paper clip, all lamps will turn off. (**X**)

Lesson 6

Choose the correct answer:

1. The ……………… is a muscle that beats inside the human body to push the blood to all body parts.
   a. stomach   b. brain   c. heart   d. hair

2. The normal heart has a ………. which creates electrical current that cause the heart to ………
   a. natural pacemaker – stop
   b. natural pacemaker – contract
   c. artificial pacemaker - stop
   d. artificial pacemaker – contract

3. The artificial pacemaker is inserted into the ………. of the human body.
   a. brain   b. chest   c. legs   d. hands

4. The artificial pacemaker contains a ………. to send information to physicians, so they know the condition of the ……………………
   a. battery – lung   c. built-in antenna - heart
   b. motherboard – brain   d. battery – heart

Put (√) or (x):

1- Sometimes electricity can be used to help our body parts to move. (√)
2- The heart is important in our body as it helps in food digestion. (X)
3- The natural pacemaker inside our heart creates electrical currents to make it contracts. (√)

4- Scientists use an artificial pacemaker to stimulate the heart muscle to beat regularly. (**√**)

5- The artificial pacemaker should contain a battery to do its function. (**√**)

Write the scientific term of each of the following:

- A muscle in the human body that beat regularly to push the blood inside the body. (**heart**)
- A device inserted into the chest to stimulate the heart to beat regularly. (**artificial pacemaker**)

Complete the following sentences:

1) The heart has a natural **pacemaker** which causing the heart to contract.
2) The artificial pacemaker has a built-in **antenna** to send information to physicians.
3) To build a pacemaker, **a battery** , an insulated electric wire with a coating and **a motherboard** are needed.

Give reasons for:

- Scientists provide the new artificial pacemaker by a built-in antenna.
    - **To send information to physicians, so they know how the heart is behaving.**

- The heart has a natural pacemaker.
    - **To create electric current that sends out through the heart, causing the heart to contract.**

What happens if …:

- A patient has a slow or irregular heartbeats.
    - **An artificial pacemaker is inserted into the chest and stimulates the heart muscle to beat at regular intervals.**

Concept (3) Lesson (1)

- Behind the wall, there are many wires leading to electrical outlets and light fixtures that conduct the electricity to all parts in the house.
- electric energy transfers to the device that are powered by electricity through wires.

Example of electric circuits:

- **Electrical poles**



Electric poles that support electric wires between cities and the wires inside walls are all examples of electric circuits.

How is electric circuit considered as a system ?

The electric circuit is a path for electricity that consists of many components that work together as one system.

Light bulb trouble

There are different ways to connect the components of an electric circuit.

1-Series connection | **2- Parallel connection**

picture (1)



picture (2)



- **In picture (1):**

When a light bulb burns out, all the other light bulbs are turned off because they are connected together in a way known as "series way"

- **In picture (2):**

When a light bulb burns out, all the other light bulbs still light because they are connected together in a way known as "parallel way"

Magnetism and Gravity

- **Gravity and magnetism are forces that affect us every day.**
- **The two forces are different from the other forces <u>because objects do not have to come into contact with one another to get affected by gravity or magnetism.</u>**



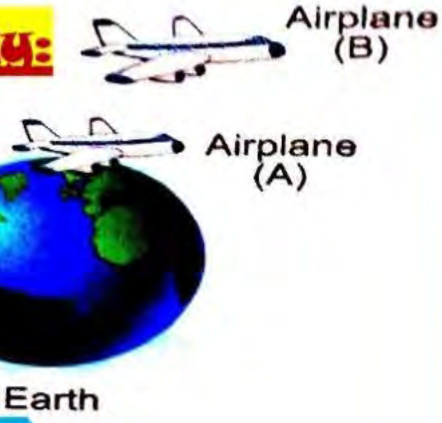
Gravity at work :

• Gravity (gravitational force):

It is a force that affects everything which has mass.

• Earth has great mass compared to everything located on its surface, so all objects on or near Earth's surface are pulled toward its center.

Factors affect the force of gravity:



1. Distance.

As the distance between objects and the center of the Earth increases, the gravitational force decreases.

Ex. The force on plane (A) is greater than that on plane (B)

2. Mass.

If the mass of an object increases, the gravity will increases.

Earth attracts all objects on its surface due to its great mass.

• We cannot see gravity, but we can observe its effect on objects such as :

- Gravity holds you to the ground.

-When you throw a ball upward into the air, it will stop moving upward at a certain point and it returns back to the Earth. (Give reason)

Due gravity.

Magnetism at work:

- **Magnets are made of iron and other materials.**
- **A magnet has a force called "magnetism".**
- **Magnetism allows the magnet to attract certain materials without making direct contact.**

Supervision: Mrs. Dalia Fawzy

• Magnetism allows magnets to attract or repel other magnets.

Magnetic Field:



• It is the area around the magnet in which its magnetic force (magnetism) appears.

• Magnetism affects certain objects that are in its magnetic field.

- We cannot see magnetic field and gravity but we can only observe their effects.

✱To see the magnetic field of a magnet, allow a magnet to attract some iron fillings.

Similarities and differences between gravity and magnetism :

Gravity	Magnetism

Similarities

✱It is not necessary for objects to come into contact with one another to get affect by gravity and magnetism.

✱Gravity and magnetism are similar in that we cannot See them.

Differences

Gravity	Magnetism
Gravity attracts any object that has mass. Gravity is always downward pulling force.	• Magnetism attracts certain materials only. • Magnetism is considered as : -A pulling force when it attracts objects or another magnet. -A pushing force when it repels another magnet

Concept (3) Worksheet (1)

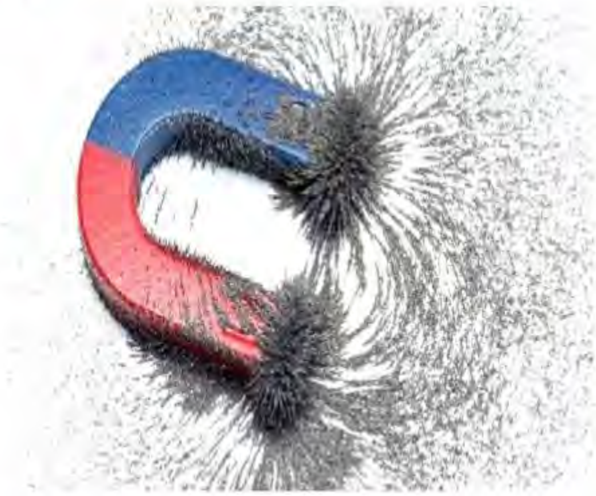
Q. 1 Put (√) or (x):

1. The force of gravity increases between objects when the distance between them increases. (   )
2. Electric circuit is the path for electricity that consists of many components that work together as one system. (   )
3. Electricity and magnetism can work together. (   )
4. Earth attracts all objects on its surface due to its great mass. (   )
5. During the falling down of an object towards Earth's surface, the gravity force increases. (   )

Q.2 Write the scientific term:

1. The area around the magnet in which its magnetic force appears. (………………….)
2. The force of Earth which attracts all objects on its surface to its center. (………………….)
3. The force that allows the magnet to attract some materials without making direct contact. (………………….)

Q. 3 Complete the following sentences :



1. This tool is surrounded by an area called……………..
2. We can observe the force of this tool by using………….. which make pattern around it.

Lesson (2)

Magnetic and Non-magnetic materials



1. **Magnets attract some metals only, such as iron (steel), nickel and cobalt.**
2. **The magnetic objects are attracted to the magnet from far distance when these objects locate at the magnetic field of the magnet.**

magnetic materials	Non-magnetic materials
• They are materials that are attracted to the magnet. •Examples: Iron, nickel and cobalt	They are materials that are not attracted to the magnet. •Examples: Aluminum, plastic, copper, paper and wood

Worksheet (2)

Q.1 Choose the correct answer:

1... is a magnetic material that is attracted to the magnet.

a. Copper b. Iron

c. Gold d. Wood

2. Some materials cannot be attracted to the magnet because they are ...

a. magnetic materials b. made of nickel, iron and cobalt.

c. non-magnetic materials. d. located at the magnetic field of the magnet.

3. When we put a piece of aluminum foil close to a magnet, it will....

a. be attracted to the magnet. b. be a magnet.

c. not attract to the magnet. d. repel with the magnet.

4. Al the following materials are called magnetic materials, except...

a. iron. b. plastic

C. nickel. d. steel.

5. Magnet affects certain objects like ......when they locate in its magnetic field

a. wood and steel b. nickel and plastic

c. iron and copper d. cobalt and steel

6. The area around the magnet in which magnetism can be observed is known as ....

a. magnetic materials. b. magnetic field.

c. non-magnetic materials. d. iron filings

Q.2 Complete the following sentences:

1. Magnets attract some metals, such as.............,............... and ....

2. The magnetic materials will be attracted to the magnet when they are located at ....of the magnet.

3. If we put a wooden spoon near to a magnet it will not attract to it because it is made of ......materials

4. Materials are classified according to their ability to be attracted to the magnet into..........,...............

5. Copper and...............will not attract to the magnet as they are.......... material

Q.3 Give reasons for:

1. Cobalt and nickel are considered as magnetic materials.

………………………………………………………………………………
………………………………………………………………………………
………………………………………………………………………

2. Wood and copper are not attracted to the magnet.

………………………………………………………………………………
………………………………………………………………………………



Lesson (3&4)

Generating electricity

Generator: is a device used in generating electricity.

Structure: **It consists of:**



1. Large magnets
2. Coiled wires.

Function:

It changes mechanical energy (kinetic energy) into electrical energy used in lighting houses and operating electrical devices.

How does a generator work?

When large magnets spin at a high speed, the spinning magnets create electrical charges on the coiled wires, so electricity is produced.

There are different forces that can be used to make

the magnets in the generator spin to generate electricity, such as :

. Water in dams is used to operate water turbines, causing the magnets in the generator to spin.



2. Winds are used to operate wind turbines, causing the magnets in the generator to spin.

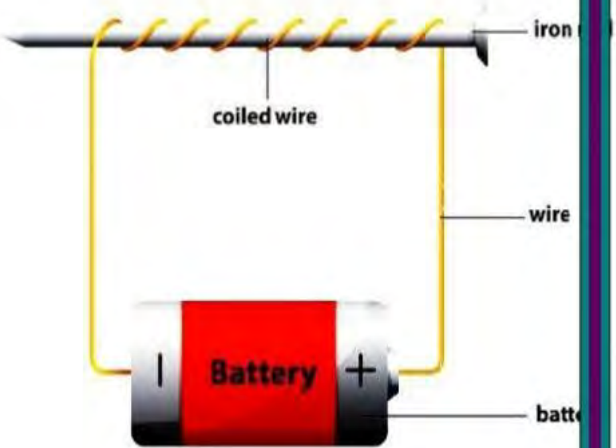


3. Sources of fuel such as oil and coal are used to make water boil producing steam which causes the magnets in the generator to spin



Energy as a System

Some information about electricity (electrical energy) and magnetism (magnetic energy).

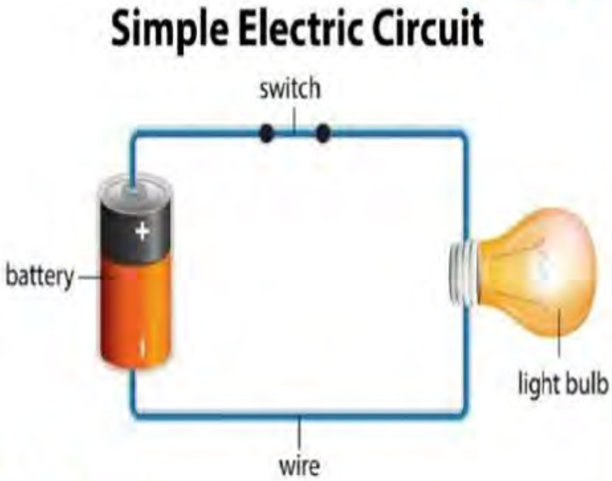


- **The flow of electricity through wires is known as "electric current".**
- **The electric current comes from the movement of tiny charged particles (electrons) through conducting wires.**
- **When an electric current flows through a wire, it forms a magnetic effect around the wire known as "magnetic field".**
- **If a wire wrapped around a metal core, the magnetic field produced by the flowing current is strengthened, so the metal core attracts the iron nails.**

Electricity and magnetism can work together.

• **Electricity:** is a form of energy that comes from a flow of electric charges (electrons) moving along a path.

• **Electrons** must flow in a steady stream, which is known as an "electric current".



• **Electric current :** is the flow of electric charges (electrons) along a closed path.

• **Electric circuit (the loop):** is a path for transmitting an electric current.

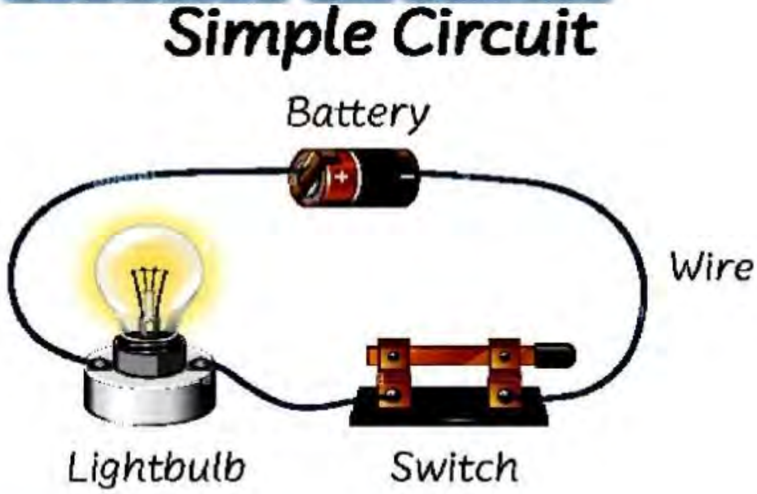
Note:

- To make the electric current flow through a circuit, the loop (circuit) must be closed (it must begin and end in the same place without any breaks in the loop).

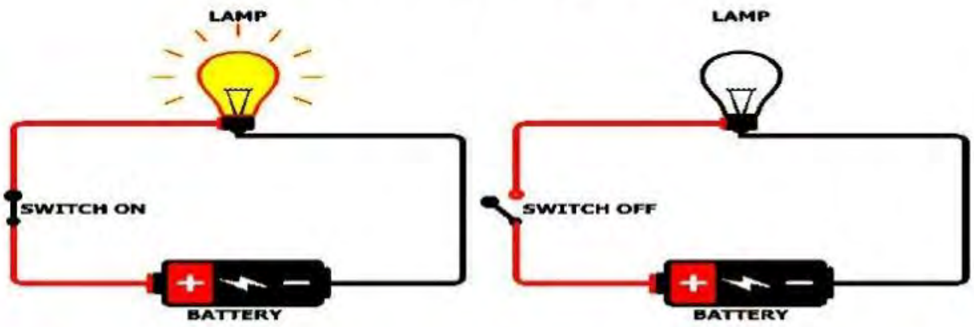
Battery or wall socket are the source of electricity in the electric circuit.

Components of electric circuits:

1. A metal wire.
2. An electric power source.
3. A switch.
4. An electric device.



The switch



- **Switch** ;is a tool to open and close the electric circuit.
- **Switch** can be automatic such as the internal switch on a thermostat, which adjusts the temperature inside devices such as the refrigerator.
- **Switch** can be manual such as a wall switch for lights.

- When the switch is closed (turned on), it closes the circuit (closed electric circuit), so the electric current flows through the circuit.

-When the switch is opened (turned off), it opens the circuit (opened electric circuit), so the electric current doesn't flow through the circuit.

What happens if: the electric circuit doesn't contain switch.

We can't open or close the circuit.

Electric conductors and insulators :

Electric conductors	Electric insulators
They are materials through which electric current (electricity) flow easily	They are materials through which electric current (electrons) does not flow easily.
"good conductors of electricity'	"bad conductors of electricity'
Examples: All metals such as copper and aluminum	*Examples:* Plastic Rubber

Current safety :

- Most electric wires are coated with rubber or plastic which are bad conductors of electricity, to protect people from electric shock.

. Touching non insulated wire that an electric current flows through causes an electric shock and may cause death, because the human body contains a lot of water which is good conductor of electricity



Worksheet (3 and 4)

Q.1 Write the scientific term

1. The device which changes mechanical energy into electrical energy. (………………..)
2. A form of energy produced from generators and turbines. (………………..)
3. The flow of electrons through an electric wire. (………………..)
4. A closed loop through which electric current can flow. (………………..)
5. A tool in the circuit which is used to open and close the circuit. (………………..)
6. It is used to adjust the temperature inside some devices such as the refrigerator. (………………..)
7. The materials that the electric charges can flow through. (………………..)
8. They are materials that don't allow electric current to flow through. (………………..)

Q.2

Choose from column (B) what suits it in column (A) :

(A)	(B)
1. Electricity	a. is a closed path through which electrons move.
2. Electric conductors	b. are materials that electric charges flow through.
3. Electric circuit	c. is a source of electric charges in the circuit.
4. Electric insulators	d. is a form of energy.
5. Battery	e. is used to open and close the circuit.
	f. are materials through which electrons can't flow.

1. ………… 2. ………… 3. ………… 4. ………… 5. …………

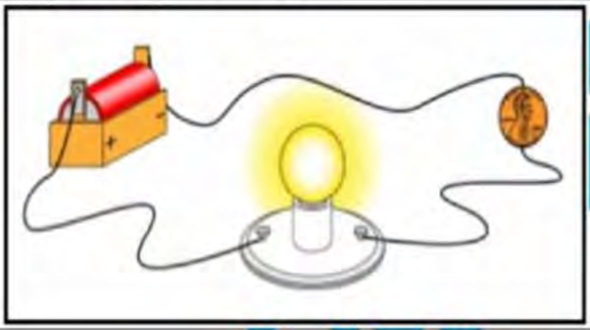
Q.3 Put (v) or (x):

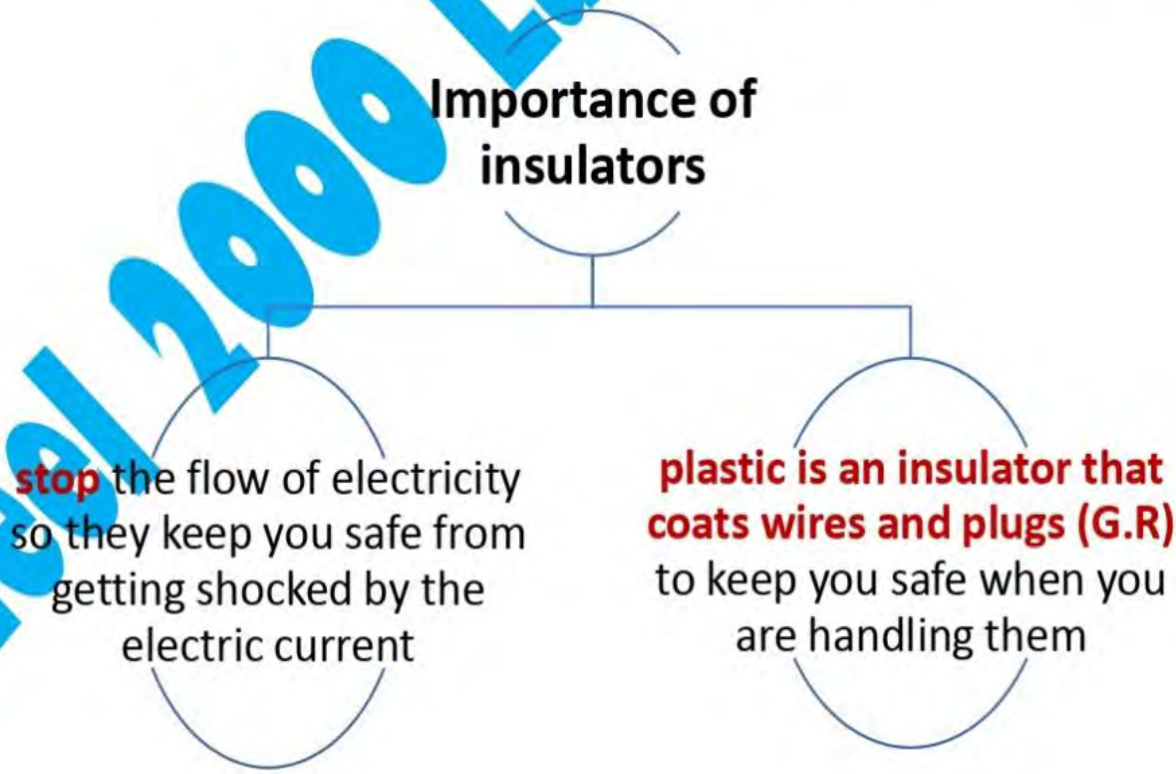
1. **Wood and plastic are electric insulators. ( )**
2. **Electric current can flow through all materials. ( )**
3. **Electric wires are covered with plastic to protect us from electric shock. ( )**
4. **Electric insulators only allow electric current to pass through them.( )**
5. **Copper, rubber and iron are electric conductors. ( )**
6. **Materials made of metals can conduct electricity. ( )**
7. **If your hand touches an insulated wire you will be shocked by electricity. ( )**
8. **Glass is a good conductor of electricity, while water is a bad conductor of electricity. ( )**

Lesson (5)

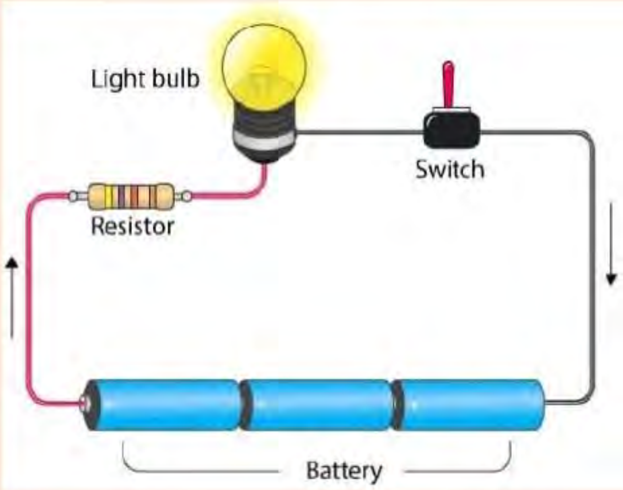
Construct an electric circuit

- Classify the materials according to their **conductivity** of electricity to :

P . O . C	Electric Conductors	Electric insulators
Definition	They are materials that **allow electrons** to flow through them	They are materials that **don't allow** electrons to flow through them
Examples	Aluminium - Copper - Iron - Paper clip - Coin	Plastic - wood - cloth - rubber
		



Resistors



they are **components** of an electric circuit that **limit** that the **flow of electric current**.

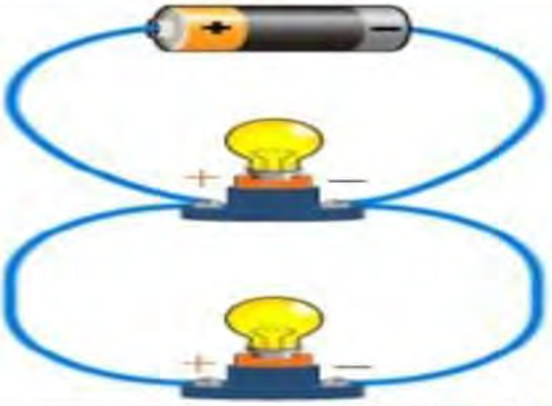
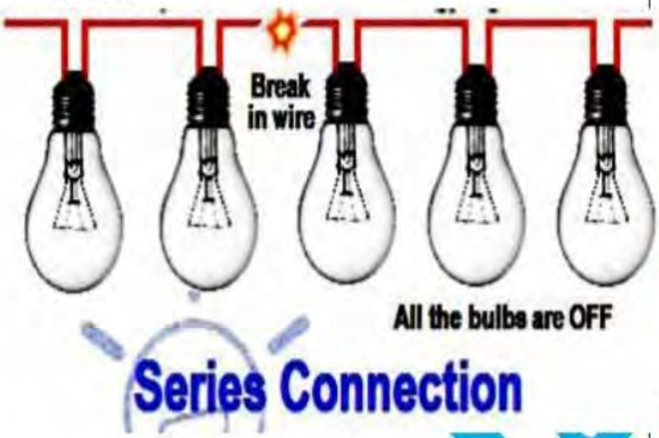
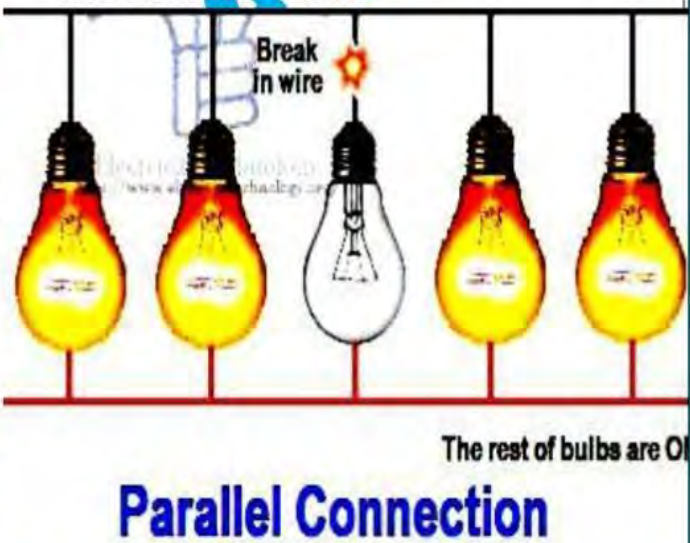
- **Its important :**
  It is used to **slow** the flow of electrons through an electric circuit to avoid the damage of electric circuit.
- **Found in :**
  1-Toasters 2-Microwaves
  3-Electric stoves

The electric ciruits can be connected in two different ways

- Series circuit
- Parallel circuit

❖ The difference between series and parallel circuits :-

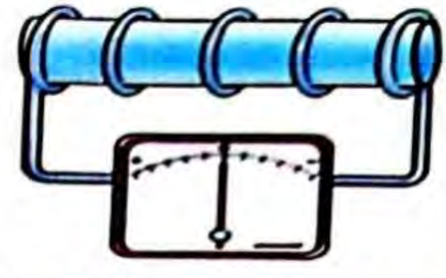
Series circuit	Parallel circuit
• All the components must be **connected** in a single loop. (one path)	• The light bulbs are **connected** in two or more different branches of the circuit.

	
• The electric current can only flow along one path	• The electric current can flow along more than one path
• If one light bulb blows out or disconnected, the others will not work.	• If one light bulb blows out or disconnected, the other light bulb will remain work.
	
	Advantages: **Parallel circuit are found in our houses to operate devices and If one of a device turn off , the others will continue.**

Note :

- **Towns and cities are part of an electric circuit, where :**
  1-The energy <u>source is the power plant</u> which has generators that push out electricity.
  2- The electricity **<u>travels along conductors</u>** called **power lines** into all kinds of electrical devices in <u>houses</u>, <u>businesses</u> and <u>factories.</u>

Galvanometer	It is a device used to detect the flow of small electric current



Galvanometer

✓ How a magnet can generate electricity ?

1-A wire coiled around a hollow cylinder

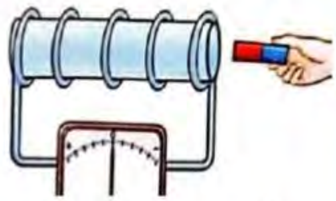
2- The coil is connected to a galvanometer.

2- A magnetic bar is placed in different distances from the coil.

Observation:

1-When the magnet was placed at rest away from the coil.

(What happens)?

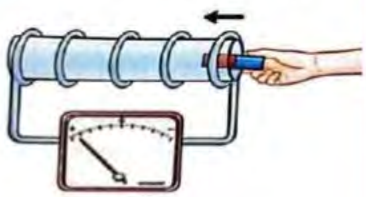


The needle of the galvanometer did not move ,

Which indicates that there was no electric current flow .

2-When the magnet was moved toward and into the coil.

(What happen)?

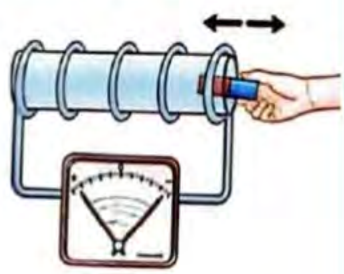


The needle of the galvanometer moved to one side ,

Which indicates that there was an electric current flow

3-When the magnet was moved rapidly back and forth inside the coil.

(What happen)?



The needle of the galvanometer also moved rapidly

Note

When the movement of the magnet Increases ,

the generated electric current increases .

Note :

- If the **number of loops** in the coil **increases** , the **movement of the needle** of the **galvanometer** will **increase**
- which indicates that the amount of generated electric current **(Voltage)** will **increase** .

There is relation between magnetism and electricity, which is used in :

1-Electric motor



2-Electric generator



3-Electric transformer



Worksheet (5)

Q.1) Choose the correct answer :

1-…………………are used to stop the flow of electricity.

a-Resistor b-Electric conductors

c-Electric insulators d-Galvanometer

2-Scientists use a ………………to detect the flow of small electric currents.

a-generator b-galvanometer

c-battery d-switch

3-Resistors are found in all of the following devices , except ……………..

a-toasters b-microwaves

c-electric stoves d-batteries

Q.2)Complete the following sentences :-

1-Rubber is an electric ……………., while copper is an electric ………

2-Electric wires are coated by …………..as it an electric insulator.

3-The electric current can flow through different branches in …………...circuits.

4-Electric circuits in houses are connected in ……………….way.

Q.3) Write the scientific term :-

1-A device can be used to detect the flow of small electric currents .

(…………………………)

2-Materials that don't allow electrons to flow through them easily .

(…………………………)

3- Materials that allow electrons to flow through them easily .

(…………………………)

Q.4) Put (√) or (×) :

1-Towns and cities are parts of an electric circuit . ( )

2-When a magnet is placed at rest away from copper coil, an electric current will be produced. ( )

3-There is no relation between magnetism and electricity. ( )

Q.5) Give reason :-

1-Some electric circuits contain resistors ?

……………………………………………………………………………

Q.6) What happens if :-

1-Electric circuits in houses are connected in series.

……………………………………………………………………………

Concept (3) Lesson (6)

➢ **How an electrical system can improve the function of a body system.**

Heart	• Is a muscle that beats consistently for the duration of our lives

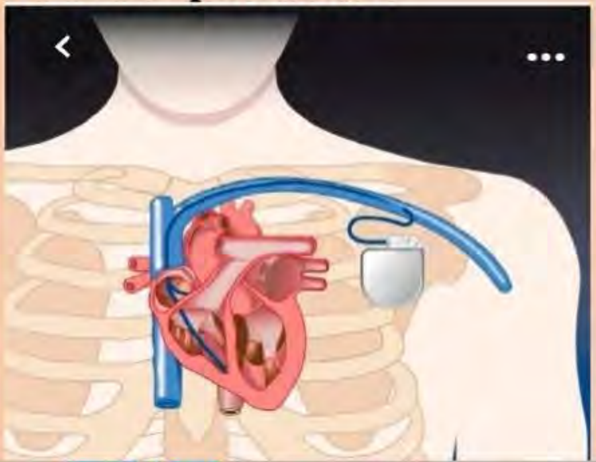
✓ **Give reason :**

The heart has a natural pacemaker ?

To create electrical currents that it sends out through the heart , causing the heart to contract.

Note :

- When the natural pacemaker starts to fail , **sometimes we need an artificial pacemaker ? (G.R)** To keep the heart beating correctly

Artificial pacemaker 	• **It is a device that operates with a battery** • **It is inserted into the chest and stimulates the heart muscle to beat at regular intervals for patients who have a slow or irregular heartbeats.** • **It has been in use for over 60 years.**

✓ **What happen if:**

A patient has a slow or irregular heartbeats?

An artificial pacemaker is inserted into the chest and stimulates the heart muscle to beat at regular intervals.

To build a pacemaker , you need

- A battery
- An insulated electric wire
- A motherboard

The future of pacemakers

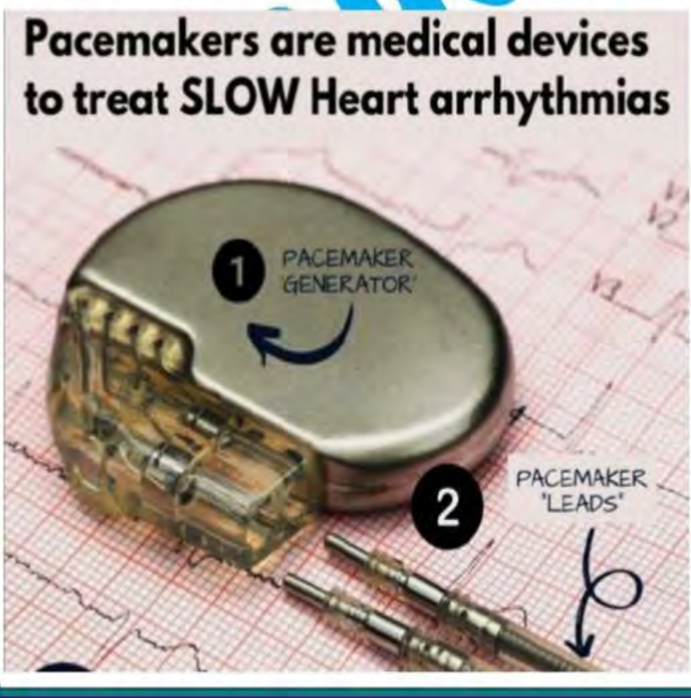
✓ **Give reason :**

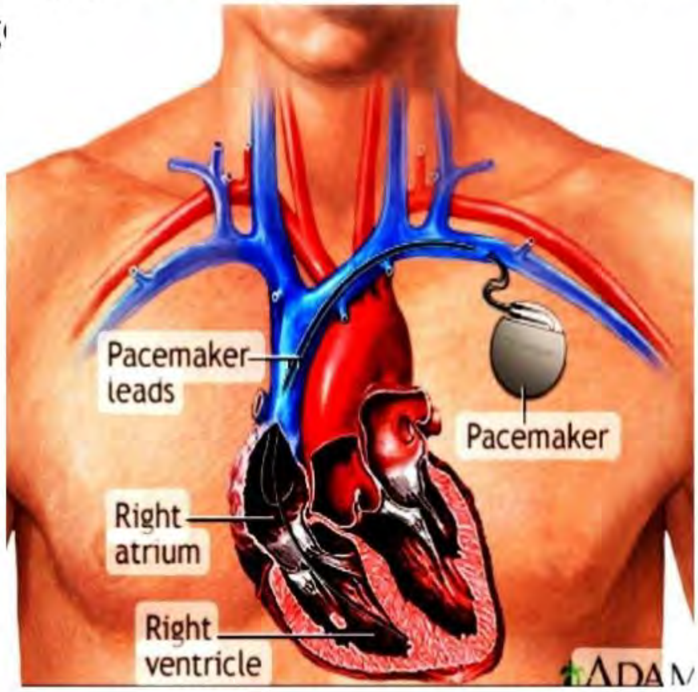
1-Scientists provide the new artificial pacemaker by a built – in antenna.

To send information to physicians, so they know how the heart is behaving

Note :

- **Pacemakers are getting more advanced by the year and becoming smaller too.**
- **Today , doctors can place a tiny , effective pacemaker well within the heart with a simple surg**





Worksheet (6)

Q.1) Write the scientific term :-

1-A muscle in the human body that beat regularly to push the blood inside the body. (………………………..)

2-A device inserted into the chest to stimulate the heart to beat regularly. (………………………..)

Q.2) Put (√) or (×) :

1-Sometimes electricity can be used to help our body parts to move . ( )

2-The heart is important in our body as it helps in food digestion. ( )

3-The artificial pacemaker should contain a battery to do its function. ( )

Q.3) Choose the correct answer :

1-The artificial pacemaker is inserted into the ……………of the human body.

a-brain b-chest c-legs d-hands

2-The …………….is a muscle that beats inside the human body to push the blood to all body parts.

a-stomach b-brain c-heart d-hair

Q.4) Give reason:

1-The heart has a natural pacemaker.

……………………………………………………………………………

……………………………………………………………………………

CONCEPT (2) WORKSHEET (6)

Q.1) Choose the correct answer:

1- d **2-a** **3- c**

Q.2) Complete the following sentences using the words below:

1- diabetes **2- energy** **3- endocrine - insulin**

4- pancreas **5- blood** **6- insulin pump**

Q.3) Write the scientific term:

1-Endocrine system. **2-Insulin hormone.**

3- Insulin pump **.4-Diabetes.**

Q.4) Give reason :

- To regulate the sugar level in blood.

Q.5) What happens if ?

-The person will be infected with diabetes disease.

CONCEPT (3) WORKSHEET (1)

Q.1 1. (×) 2. (√) 3. (√) 4.(√) 5.(√)

Q.2

1. The magnetic field **2. Gravity.** **3. Magnetism.**

Q3 1. magnet - iron.

2. magnetic field.

3. iron filings.

CONCEPT (3) WORKSHEET (2)

Q.1

1-b 2. C 3. C 4. b 5.d 6. b

Q.2

1. iron, nickel- cobalt. 2. the magnetic field 3. non-magnetic

4. magnetic – non-magnetic 5. plastic - non-magnetic

Q.3

1. Because they are attracted to the magnet.

2. Because they are non-magnetic materials.

CONCEPT (3) WORKSHEET (3 & 4)

Q.1

1. Generator. 2. Electricity. 3. Electric current.

4. Electric circuit. 5. Switch. 6. Thermostat.

7. The electric conductors. 8. The electric insulators.

Q. 2 *1.d 2. B 3. a 4.f 5. c*

Q.3

1. (√) 2. (x)

3. (√) 4. (x)

5. (x) 6. (√)

7. (x) 8. (x)

CONCEPT (3) WORKSHEET (5)

Q.1) Choose the correct answer:

1-b	2-c	3-d

Q.2) Complete the following sentences:

1-insulator - conductor	2-plastic	3-parallel	4- parallel

Q.3)Write the scientific term:

1-Galvanometer	2-Electric insulator	3-Electric conductors

Q.4)Put (√) or (×):

1-√	2-×	3-×

Q.5) Give reason :-

1-Because resistors are used to slow the flow of electrons through an electric circuit to avoid the damage of its components.

Q.6) What happens if:

1-If one light bulb is disconnected, the other one will not work .

CONCEPT (3) WORKSHEET (6)

Q.1) Write the scientific term:-

1-The heart	2-Artificial pacemaker

Q.2) Put (√) or (×):

1-√	2-×	3-√

Q.3) Choose the correct answer:

1-Chest	2-heart

Q.4) Give reason :

1- To creates electrical currents that is sends out through the heart, causing the heart to contract.

Revision concept 1.2

Write the scientific term:

1. Cells in the form of long fibers to allow movement.	
2. The system which helps in body movement.	
3. The muscles that attached to the bones of skeletal system.	
4. Types of muscles which form the heart.	
5. Muscles that move automatically and you cannot control their movement.	
6. Muscles that you can control their movement	
7. System that consists of glands that secrete hormones.	
8. System that transports gases, nutrients, and hormones throughout the body.	
9. System which consists of heart and blood vessels.	
10. System which provides the body with oxygen and get rid of carbon dioxide gas.	
11. System which converts the complex food into simpler substance.	
12. The process of breaking down the complex food into simpler substance.	
13. Liquid in your mouth helps in digestion process.	
14. Organ in which absorption of nutrients starts.	
15. Organ which absorbs water from undigested food.	
16. Organ which store glucose in the form of glycogen.	
17. System that responsible for storing and get rid of waste materials produced from cell.	
18. The process of removing waste materials from the body.	=
19. The organ that helps in excretion of sweat.	

20. The system that responsible for excretion of carbon dioxide gas.	
21. System that responsible for removing waste materials from the blood in the form of urine.	
22. Process of expelling urine from the body.	
23. Microscopic filter that filters the blood and removes harmful substance from the body.	
24. Organ which transports the urine from the two kidneys to the bladder.	
25. Substance that formed due to the breakdown of proteins inside the body cell.	
26.Disease that is resulting from the disorder of secreting insulin hormone by pancreas.	
26. Hormone that regulates the amount of sugar that the body can use for energy.	
27. Device attached to the body to help diabetics control the blood sugar level.	
28. Organ that produces insulin hormone.	

Give reason for:

1. Digestive system is very important to skeletal system?

   ……………………………………………………………

2. Nervous system depends on digestive system and circulatory systems to do its functions?

   ……………………………………………………………..

3. Digestive system and circulatory systems depend on the nervous system to do their functions?

   ……………………………………………………………

4. Muscle cells in the form of long fiber ?

   ……………………………………………………………

5. Muscle cells do not work alone?

……………………………………………………………………………

6. Cardiac muscle considered involuntary muscles?

……………………………………………………………………………

7. Skeletal muscles are considered as voluntary muscles?

…………………………………………………………………………...

8. Cardiac muscle contracts and relaxes without stopping?

……………………………………………………………………………

9. When the body faces a danger the heartbeats increase?

……………………………………………………………………………

10. When the body faces a danger the breathing rate increases and heartbeats increase?

……………………………………………………………………………

11. Wall of small intestine contain blood vessels?

……………………………………………………………………………

12. Undigested food becomes solid wastes inside the large intestine?

……………………………………………………………………………

13. Your mouth containing saliva?

……………………………………………………………………………

14. Blood cells and proteins cannot pass through the kidney's nephrons?

……………………………………………………………………………

15. The two kidneys contain nephrons?

……………………………………………………………………………

16. Formation of urea inside the body of human?

……………………………………………………………………………

17. Diabetics must give themselves regular shots of insulin?

……………………………………………………………………………

What happens …

1. To the brain of cyclist when he sees a dangerous situation?
   ……………………………………………………………………
2. Circulatory system cannot transmit nutrients to the nerve cells?
   ……………………………………………………………………
3. There is no muscular system in the human body?
4. When the forearm moves up towards your shoulder?
   ……………………………………………………………………
5. When the forearm moves down away from your shoulder?
   ……………………………………………………………………
6. To the human body when heartbeats increase during danger?
   ……………………………………………………………………
7. When the diaphragm muscle contracts?
   ……………………………………………………………………
8. When the diaphragm muscle relaxes?
   ……………………………………………………………………
9. Glycogen that stored in liver when you face danger situation?
   ……………………………………………………………………
10. Your body doesn't get rid of waste?
    ……………………………………………………………………
11. If the blood passes through nephrons of the two kidneys?
    ……………………………………………………………………
12. Pancreas doesn't make its function correctly?

……………………………………………………………………

Answers

Write the scientific term:

1. Cells in the form of long fibers to allow movement.	Muscle cell
2. The system which helps in body movement.	Musculoskeletal system
3. The muscles that attached to the bones of skeletal system.	Skeletal muscles
4. Types of muscles which form the heart.	Cardiac muscles
5. Muscles that move automatically and you cannot control their movement.	Involuntary muscles
6. Muscles that you can control their movement	Voluntary muscles
7. System that consists of glands that secrete hormones.	Endocrine system
8. System that transports gases, nutrients, and hormones throughout the body.	Circulatory system
9. System which consists of heart and blood vessels.	Circulatory system
10. System which provides the body with oxygen and get rid of carbon dioxide gas.	Respiratory system
11. System which converts the complex food into simpler substance.	Digestive system
12. The process of breaking down the complex food into simpler substance.	Digestion process
13. Liquid in your mouth helps in digestion process.	saliva
14. Organ in which absorption of nutrients starts.	Small intestine

15. Organ which absorbs water from undigested food.	Large intestine
16. Organ which store glucose in the form of glycogen.	Liver and muscles
17. System that responsible for storing and get rid of waste materials produced from cell.	Excretory system
18. The process of removing waste materials from the body.	Excretion process
19. The organ that helps in excretion of sweat.	skin
20. The system that responsible for excretion of carbon dioxide gas.	Respiratory system
21. System that responsible for removing waste materials from the blood in the form of urine.	Urinary system
22. Process of expelling urine from the body.	Urination
23. Microscopic filter that filters the blood and removes harmful substance from the body.	Nephron
24. Organ which transports the urine from the two kidneys to the bladder.	ureter
25. Substance that formed due to the breakdown of proteins inside the body cell.	Urea
26. Disease that is resulting from the disorder of secreting insulin hormone by pancreas.	Diabetes disease
27. Hormone that regulates the amount of sugar that the body can use for energy.	Insulin
28. Device attached to the body to help diabetics control the blood sugar level.	Insulin pump
29. Organ that produces insulin hormone.	Pancreas

Give reason for

1. Digestive system is very important to skeletal system?

Because digestive system provides the skeletal system with nutrients needed for growth and fracture healing.

2. Nervous system depends on digestive system and circulatory systems to do its functions?
   Because nerve cells need nutrients to do its functions digestive system digest the food and circulatory system transmits the nutrients to the nerve cells.
3. Digestive system and circulatory systems depend on the nervous system to do their functions?
   Because the nervous system controls the muscles of stomach and the muscle of heart.
4. Muscle cells in the form of long fiber ?
   To allow movement.
5. Muscle cells do not work alone?
   Because the size of the muscle cell is very small.
6. Cardiac muscle are considered involuntary muscles?
   Because we cannot control its movement.
7. Skeletal muscles are considered as voluntary muscles?
   Because we can control their movement.
8. Cardiac muscle contracts and relaxes without stopping?
   To allow the heart pumps the blood carrying oxygen to all the body cell.
9. When the body faces a danger the heartbeats increase?
   To pumps more blood to the muscles.
10. When the body faces a danger the breathing rate increases and heartbeats increase?

To allow the body to send more oxygenated blood to the muscles .

11. Wall of small intestine contain blood vessels?

To absorb the nutrients and carry them to all the body parts.

12. Undigested food becomes solid wastes inside the large intestine?

Because large intestine absorbs water from undigested food.

13. Your mouth containing saliva?

To soften the food and begins the chemical breakdown the chemical breakdown of food.

14. Blood cells and proteins cannot pass through the kidney's nephrons?

Because they are too large.

15. The two kidneys contain nephrons?

To filter the blood and remove harmful substances from the body.

16. Formation of urea inside the body of human?

Due to break down of protein inside the body cells.

17. Diabetics must give themselves regular shots of insulin?

To regulates the sugar level in blood.

What happens …

1. To the brain of cyclist when he see a dangerous situation?
   The brain sends a signals to the muscles that contract and allow his body to face the danger.
2. Circulatory system cannot transmit nutrients to the nerve cells?
   Nerve cells cannot perform their functions.
3. There is no muscular system in the human body?
   The body cannot move.
4. When the forearm moves up towards your shoulder?

The muscle in front of the upper arm contracts and the muscle in the back of upper arm relaxes.

5. When the forearm moves down away from your shoulder?
   The muscle in front of the upper arm relaxes and the muscle in the back of the upper arm contracts.
6. To the human body when heartbeats increase during danger?
   The heart pumps more blood to the muscles and blood pressure increases.
7. When the diaphragm muscle contracts?
   The lungs take in the air rich in oxygen gas.
8. When the diaphragm muscle relaxes?
   The lungs release the air rich in carbon dioxide gas.
9. Glycogen that stored in liver when you face danger situation?
   Glycogen will convert into glucose again.
10. Your body doesn't get rid of waste?
    Will get sick.
11. If the blood passes through nephrons of the two kidneys?
    The blood will be filtered from harmful substances.
12. Pancreas doesn't make its function correctly?
    Person will be infected with diabetes disease.